A

TREATISE

OF THE

MATERIA MEDICA.

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PART II.

OF MEDICINES.

IN compoſing this Treatiſe, I propoſed to divide it into two parts; the one treating of Aliments, the other of Medicines: and having now finiſhed as well as I can what relates to the firſt, I proceed to the ſecond.

I HAVE endeavoured above to explain the difference of theſe two ſubjects; and although, with reſpect to the ſubſtances to be comprehended under each, they are not to be ſtrictly diſtinguiſhed, as it ſometimes happens that the ſame ſubſtance may belong to both ſubjects; yet I maintain, contrary to the practice of writers on the materia medica, That ſuch ſubſtances ſhould be conſidered under the different views that may be taken of them as aliments or medicines; and that theſe ſhould be conſidered ſeparately, to avoid diſtracting the ſtudent by different views preſented at the ſame time.

IT is therefore that my readers will find here ſeveral ſubſtances under the title of Medicines, which were treated of before under that of Aliments. This, however, was neceſſary upon my plan, and will I hope be found uſeful.

WITH reſpect to the order in which medicines are to be conſidered, I have endeavoured above to determine what is the moſt proper plan for the purpoſe; and accordingly I have given a table explaining the whole of it. I am now to follow that plan; and therefore proceed, in the firſt place, to treat of Aſtringents.

CHAPTER I.

OF ASTRINGENTS.

ASTRINGENTS are ſuch ſubſtances as, applied to the human body, produce a contraction and condenſation in the ſoft ſolids, and thereby increaſe their denſity and force of coheſion. If they are applied to longitudinal fibres, the contraction is made in the length of theſe; but if applied to circular fibres, they diminiſh the diameters of the veſſels or cavities which the fibres ſurround.

THE operation of aſtringents in general, in condenſing the ſolid, appears from their uſe in the tanning or making of leather, in which they are ſo frequently employed.

THE ſame operation alſo appears from their antiſeptic power, which ſeems to depend upon their preſerving the firmneſs and coheſion of the animal ſubſtances to which they are applied, for a much longer time than the firmneſs would have continued in theſe ſubſtances without ſuch application.

BY what means aſtringents produce the contraction of the ſolid parts of animal bodies, is not very evident. It does not ſeem to be by introducing a matter into their ſubſtance; and in ſome caſes it ſeems to be rather by abſorbing and abſtracting their fluid parts. In ſome caſes, where the ſubſtances applied are ſuch as coagulate the fluids of the human body, as acids and alcohol, we can readily underſtand how the ſame ſhould condenſe and contract the ſolids formed of the ſame fluids which thoſe matters coagulate. It does not, however, appear, that other aſtringents, void of acidity, act in the ſame manner; and their operation muſt be referred to an attraction taking place between theſe aſtringents and the particles of the animal ſolid.

In forming a table of medicines according to their ſeveral operations on the human body, it ſeemed proper to diſtinguiſh them as they operate upon the ſimple ſolid, which is much of the ſame nature in the dead as in the living body; or as they operate upon the ſenſible and moving ſolids, which have their qualities and powers only as they exiſt in a living body. This diſtinction, on many occaſions, will be neceſſary and uſeful, but we cannot follow it throughout; and on theſe occaſions, where the medicines at the ſame time operate upon both the ſimple and living ſolid, the conſideration of their operation cannot be taken ſeparately.

This is the caſe with reſpect to our preſent ſubject, as aſtringents often operate upon the ſolids of both kinds. This, indeed, has not been always obſerved; and it has been commonly ſuppoſed, that aſtringents act more upon the ſimple than upon the living ſolid: and therefore, that they act almoſt only on the parts to which they are immediately applied. A very learned phyſician in writing on hemorrhagy, has this expreſſion: "I do not lay any great ſtreſs upon the uſe of internal aſtringent "remedies, becauſe it does not appear likely from reaſoning "that they ſhould do any ſervice; and I am far from being

" convinced by experience that they ever do, except perhaps in " hemorrhagies of the primæ viæ," HEBERDEN in Med. Tranſ. Vol. II. 432. This, however, I cannot hold to be juſt; and by the corrugation and conſtriction of the whole mouth and fauces, which happens from a ſmall portion of aſtringents being applied to a ſmall part of the tongue, I hold it to be demonſtrated that aſtringents act upon the ſentient nerves; and therefore that the aſtringent effects may be communicated from one part to very diſtant parts of the body. The ſame concluſion appears clearly to be formed from this, that aſtringents taken into the ſtomach ſhow their effects in other parts of the body ſo quickly, that they can hardly be ſuppoſed to have paſſed further than the ſtomach itſelf; and therefore their ſudden effects in diſtant parts muſt be aſcribed to an aſtringent power communicated from the ſtomach to thoſe other parts.

IT may, indeed, be alleged, that the aſtringent matter is in ſome caſes carried further than the ſtomach, and into the courſe of the circulation: but it muſt ſtill be obſerved, that in many of thoſe caſes the quantity of matter introduced is ſo ſmall, that when again diffuſed in the maſs of blood, and equally diſtributed to the different parts of the body, it is obvious, that the portion of it applied to a particular part cannot be ſufficient to produce any effect upon it; and therefore the effects which appear muſt be aſcribed to the general operation on the ſtomach. Of all this doctrine, and particularly of the propagation of aſtringent power from the ſtomach to other parts, we have a ſtrong proof in this, that ſome of the moſt ſimple aſtringents taken into the ſtomach very ſoon after prevent the recurrence of a paroxyſm of an intermittent fever, which implies a very general operation on diſtant parts.

As it is, therefore, eſtabliſhed, that aſtringents act upon the moving fibres, as well as upon the ſimple ſolid, it will be readily conceived, that to their operation on the former their moſt conſiderable effects on the living body are to be aſcribed. As they contract the moving fibres, and increaſe their force of coheſion, they muſt increaſe their contractility, or what I call their tone, and they are, therefore, often properly named Tonics; and upon the ſame ground are fitly enough named Strengtheners or Roborants: which under theſe titles will be more fully conſidered hereafter.

THE matter of aſtringents has been variouſly jndged of, and generally ſuppoſed to conſiſt of acid and earth. In the aſtringents of an acerb taſte, ſuch a compoſition ſeems to be evident; and the ſuppoſition is confirmed by obſerving, that an aſtringent quality is produced by certain combinations of acid and earth as in the caſe of Alum. We muſt not, however, conclude this to be a general propoſition, as in many caſes a combination of acid and earth produces matter of very little aſtringent power, as happens in the caſe of acids joined with calcarious earths; and in one caſe an acid joined with an abſorbent earth, as in magneſia alba, produces matter of a purgative quality. We cannot, therefore, admit of this general propoſition, that aſtringents are formed by a combination of acid and earth. With reſpect to the greater part of the vegetable aſtringents, the preſence of an acid is by no means evident; and it is certain, that in the greater part of them, the quantity of acid is not ſo much as to ſaturate the earthy or other parts of the matter in their compoſition; for the whole ſubſtance of the aſtringent appears ſtill to be a powerful abſorbent of acids capable of abſtracting them from other ſubſtances with which they are joined, as we ſhall ſhow more fully preſently.

THIS leads me to ſay in what manner we diſcover an aſtringent quality to be in certain bodies.

IN the *firſt* place, we diſcover it moſt certainly by their effects on the human body, and that by the taſte they give in the mouth; a ſenſe of conſtriction not only in the parts with which they come immediately in contact, but alſo in the whole of the internal ſurface of the mouth and fauces. This ſenſe of conſtriction is different from different ſubſtances; and I believe its degree may be taken as a mark of the power which ſuch ſubſtances may exert as aſtringents in the ſtomach, or other parts of the body.

In the *ſecond* place, we diſcover an aſtringent quality in bodies by their being applied to a ſolution of green vitriol, in which they produce a black colour. This we ſuppoſe to be owing to the aſtringents abſtracting the acid of the vitriol from the iron it was before joined with; and that therefore the iron falls down in the form of a black powder. I ſhall not inſiſt further on the theory of this operation, but ſhall endeavour to apply it to our purpoſe.

As experiments ſhow that aſtringent ſubſtances applied to the ſolution of vitriol produce more ſuddenly a black colour, and that of a greater degree of blackneſs, in proportion to the other marks they give of their aſtringency, ſo we may employ this experiment to determine the power of aſtringency in different ſubſtances. For this purpoſe, the learned BERGIUS, in his late Treatiſe on the Materia Medica, has given us his experiments of the application of almoſt every vegetable ſubſtance to the ſolution of green vitriol; and I have much reaſon to believe, that his experiments have been accurately made and faithfully reported. From them, I think we learn what I have juſt now alleged, that the aſtringent power is in proportion to the ſuddenneſs with which they ſtrike a black colour, and to the degree in which they produce it. By this the learned author points out what ſubſtances are the moſt powerful aſtringents; and in like manner, what are the weaker kinds of the many which formerly entered promiſcuouſly into our liſts of aſtringents: and I ſhall hereafter make uſe of his experiments in determining the aſtringent power of particular ſubſtances.

BUT before I enter upon this, I think it proper to obſerve here, that every ſubſtance which ſtrikes a black colour with a ſolution of green vitriol, is not to be conſidered as an aſtringent; for it may happen that a ſmall portion of aſtringent matter may be preſent in ſubſtances in which a matter of contrary quality truly prevails; and there cannot be a ſtronger inſtance of this than in the herb Malva, the juice of which ſtrikes ſome black colour: and from the experiments of BERGIUS, it will appear that the ſame happens with reſpect to many other vegetable ſubſtances which have not been, nor cannot be, conſidered as aſtringent matters.

A *ſecond* obſervation to be made is, that certain aſtringents, which otherwiſe give proof of their aſtringent power, do not ſtrike a black colour with the ſolution of vitriol, or do it more weakly than in proportion to their aſtringent powers. We have an inſtance of this in the juice of quinces, and ſome other acerb ſubſtances; which is probably owing to this, that the aſtringent matter in theſe ſubſtances is ſaturated with the acid that is already preſent in them.

WHAT judgment, concerning the nature of vegetables, may be formed from the different colours which are produced by them when applied to the ſolution of vitriol remains yet to be inquired into.

THE general effects of aſtringents on the human body are expreſſed above in the definition; but in what different ſtates of the body, that is, in what diſeaſes they are to be employed, is yet to be ſaid.

IN all caſes of general debility, they may be ſuppoſed to be uſeful; and in that ſtate which has been called a Cachexy, and which often forms the beginning of dropſy, the preparations of iron formed by a combination of an acid with that metal have been employed with much benefit: but I do not know of any other ſimple aſtringent, that in the ſame caſe has been employed with advantage. In one caſe, their power in taking off the atony of the ſyſtem is very remarkable, and that is in the caſe of intermittent fevers. In another place, in my *Firſt Lines of the Practice of Phyſic*, I have ſhown that the recurrence of the paroxyſm of intermittent fevers depends upon the recurrence of a ſtate of atony in the ſyſtem, and that the paroxyſm is prevented by various means of obviating the recurrence of that atony; and a frequent experience has ſhowed the power of aſtringents in this reſpect. It is true, that, even for this purpoſe, their tonic powers are much increaſed by their being combined with bitters, as we ſhall explain in another place; but in the mean time, as the moſt ſimple aſtringents frequently anſwer the purpoſe, it does not prevent our perceiving that aſtringents by themſelves are capable of increaſing the tone of the moving fibres over the whole body.

ASTRINGENTS are conſidered as eſpecially uſeful in reſtraining exceſſive evacuations; and, in the firſt place, hemorrhagies, or

I BELIEVE the moſt part of practitioners have had occaſion to obſerve the ſame inefficacy of internal aſtringents in the caſe of gleets, or ſerous evacuations from the urethra in males; and therefore will judge with me, that materia medica writers have been much too liberal in aſcribing virtues to aſtringents in thoſe caſes. How far a diſtinction is to be made in thoſe caſes with reſpect to different aſtringents, I ſhall conſider hereafter.

IT may be ſuppoſed by ſome, that there is an analogy between thoſe caſes of increaſed ſerous evacuations, and the exceſſive diſcharge of a ſerous fluid from ulcers; and, therefore, that to remedy this, internal aſtringents may be employed. I believe the propriety of this meaſure may be well founded; but at the ſame time, it does not appear that the good effects in theſe caſes depends upon a conſtriction produced on the extremities of the veſſels pouring out the fluids, ſo much as upon reſtoring the tone, perhaps the inflammatory ſtate, of the veſſels that is neceſſary to the production of laudable pus.

IN mentioning the general effects of aſtringents, I muſt not omit their ſingular power of relieving the ſymptoms which attend the preſence of a calculus in the urinary paſſages. Among the diſſertations of DE HEUCHER, formerly a profeſſor at Wittemberg, there is one under this title, *Calculus per adſtringentia pellendus.* In this he ſhows, that almoſt at all times, and by the moſt eminent phyſicians, aſtringents have been employed in calculous caſes. He is, indeed, intent upon ſhowing that aſtringents have been employed in promoting the excretion of calculi; but I preſume that, in the caſes in which thoſe remedies appeared ſucceſsful, the calculous matter was only ſuppoſed to be evacuated, becauſe the patient was relieved from the ſymptoms that he formerly laboured under. But we now know that theſe ſymptoms may be relieved without the ſtone's having been diſſolved or evacuated: and among other may be reckoned. A proof of this appears in the uſe of the leaves of the *Uva urſi;* which not only from the experiments medicines that may operate in this manner, I believe aſtringents of the late DE HAEN, but alſo from my own, I have found to be often powerful in relieving the ſymptoms of calculus. This plant is manifeſtly a powerful aſtringent; and in what manner this, and other aſtringents are uſeful in the caſes mentioned, may be difficult to explain; but I ſhall offer a conjecture on the ſubject. I ſuppoſe their effect to depend upon their abſorbing acid in the ſtomach. Their powerful attraction of acid we have mentioned above: and that thereby they may be uſeful in calculous caſes, is rendered probable by this, that the medicines which of late have been found the moſt powerful in relieving the ſymptoms of calculus, are a variety of alkalines, which are known to do this without their acting at all in diſſolving the ſtone.

WHEN we have thus ſaid in what diſeaſes aſtringents are uſeful, it is proper to remark, that materia medica writers mark them as uſeful in a diſeaſe in which we would allege, both from theory and experience, that they are of no uſe at all; that is, in the caſe of hernia, which in our opinion does not depend upon any laxity of the inteſtinal canal, but upon the laxity of the containing teguments; to which we believe the operation of internal aſtringents can hardly reach.

AFTER mentioning the diſeaſes in which aſtringents are ſuppoſed to be uſeful, it is proper for me to obſerve that they are improperly employed in reſtraining evacuations, whether of blood or of ſerous fluids, when theſe evacuations can be truly conſidered as critical, or as neceſſary to relieve a plethoric ſtate of the y ſtem, except when the evacuations proceed to an exceſs that threatens to be in danger of inducing death, or at leaſt of inducing a great and dangerous debility. In ſuch caſes, the judicious practitioner will balance between the conſequences to be apprehended: but we cannot miſs to remark here, that the Stahlians, and other German phyſicians, by ſuppoſing plethora and cacochymy more frequently than they exiſt, have limited the employment of aſtringents too much.

ASTRINGENT matter is very generally preſent in the vegetable kingdom, and ſometimes in all the different parts of plants; but moſt frequently in their barks, ſometimes in the roots, more rarely in the leaves, and more ſeldom ſtill in the flowers; though there are exceptions to all of theſe as general rules.

WITH reſpect to the pharmaceutical treatment of aſtringents, we in the firſt place obſerve, that they are moſt uſeful when they are taken in their entire ſtate, and when given, as the common language is, in ſubſtance; and we are perſuaded that the gaſtric liquor extracts them more powerfully than any other menſtruum we could apply. It is, however, on many occaſions, proper to employ them in a liquid form; and for that purpoſe they have been treated by diſtillation, infuſion, and decoction.

ASTRINGENTS very rarely conſiſt of odorous or volatile parts. They are very univerſally of a fixed nature, and nothing riſes from them in diſtillation with water; and even in thoſe caſes where their odorous and volatile parts ariſe, it is found that no part of the aſtringent quality is at the ſame time communicated to the diſtilled water; and therefore the diſtilled waters drawn from aſtringents formerly kept in the ſhops, were on that account abſolutely inert.

ASTRINGENTS are properly enough treated by infuſion, and readily yield their qualities either to an aqueous or ſpirituous menſtruum. The extract obtained by water is in larger proportion than that obtained by ſpirit: but that the aſtringency is greater in the one than in the other is not certainly determined; and the choice of the infuſions is made rather according as the menſtruum is more or leſs adapted to the purpoſe of the medicine, than by any conſideration of the aſtringent power extracted by it.

ASTRINGENTS are alſo treated by decoction in water; and in this way a ſtronger impregnation can be obtained than by infuſion: but it appears to me that the aſtringent matter is extracted in a more entire ſtate by infuſion, and that in decoction there is always ſome decompoſition takes place; with what effect, however, on the ſubſtance as a medicine, we cannot certainly determine.

HAVING thus treated of aſtringents in general, I proceed now to give ſome remarks on the particular aſtringents that have been, or may be, employed, and that in the order of the general catalogue of medicines that has been prefixed.

PARTICULAR ASTRINGENTS.

BOLUS RUBRA.

THE bolus armena ſtood in our diſpenſatory liſts long after we had ceaſed to import any ſuch ſubſtance from the eaſt; but it is now entirely omitted in our Britiſh catalogues.

A NUMBER of ſimilar earths, under the titles of *Terræ Sigillatæ*, or ſealed earths, ſtill hold a place in foreign catalogues; but they are now entirely neglected in Britain, and we retain of the bolar earths the *Bolus Gallica* only.

THIS, however, I expect will alſo be expunged; for I cannot perceive in it any ſort of medicinal quality. Applied to the tongue in a dry and powdery ſtate, by abſorbing the moiſture of the part, they give ſome ſenſe of auſterity and aſtringency; but upon a more complete diffuſion, that entirely diſappears: and as they are not ſoluble in any of the animal fluids, I cannot believe in their exerting any aſtringent power even in the alimentary canal.

I HAVE never found them of any uſe; and I muſt have better authority than that of the late Dr HILL to make me believe that they have ever been of ſervice in diarrhœas and dyſenteries. See HILL's Materia Medica, page 180. Theſe earths diſcover no alkaline part in their compoſition that can be diſſolved by vegetable acids, and therefore they cannot be uſeful as abſorbents of acid in the ſtomach; and much leſs do they diſcover any acid that can be the foundation of Dr BOERHAAVE's character of Laudatiſſimæ boli. See Aph. 88. at the end of the paragraph. Nor can I find any foundation for the opinion of his commentator VAN SWIETEN, page 128. that by correcting putrid matters, they are uſeful in dyſenteries attended with much putreſcency.

CRETA.

MANY phyſicians would introduce here this and many other abſorbent earths, as they ſuppoſe theſe, when combined with acids, to prove aſtringent: but ſo far as I can judge by the ſenſible qualities of ſuch compounds, their aſtringent quality is very inconſiderable; and the effects of abſorbents in inducing coſtiveneſs, even when uſed very largely, we have not obſerved. Their effects, either in this way or in curing diarrhœa, if truly obſerved, we would aſcribe rather to their correcting acidity than to their aſtringency. See what I have ſaid above on aſtringents in general.

ALUMEN.

I DO not think it my buſineſs here to give any account of the practices by which this ſubſtance is produced from ſeveral foſſil matters, as this has been done already by ſeveral writers more ſcientifically than I could; nor do I think it neceſſary after MARGRAAF to give any account of the peculiar part of *Clay* that, with the vitriolic acid, enters into the compoſition of alum. It is enough for me, that this is a ſubſtance very well known; and that in the ſame ſtate in which it is employed in various arts, and as commonly exhibited in our ſhops, it is ſufficiently pure and fit for the purpoſes of medicine.

HERE we conſider only its uſe in medicine, and chiefly as an aſtringent of the moſt powerful kind. It is uſed both internally and externally. With reſpect to its internal uſe, I am ſurpriſed to find that it ſeems not to have been employed with other aſtringents in diarrhœa. Some materia medica writers indeed mention its being ſuited to cure this diſeaſe; but I have not met with any practical writer who preſcribes it in ſuch caſes. Governed like other practitioners by imitation and habit, I have ſeldom employed it; but I have employed it ſo much as to make me judge that in diarrhœas it may be uſed with advantage.

IT has been given internally, chiefly in the caſes of hæmorrhagy from the lungs or from the uterus. In the caſe of hæmoptyſis I have not found it uſeful; and this I believe happened from the hæmoptyſis being always an active hæmorrhagy, in which aſtringents ſeem to be always hurtful. But in menorrhagia, and other uterine hæmorrhagies, which often depend upon a laxity of the veſſels of the uterus, it may be of ſervice; and we have often found it to be ſo. It ſhould be given at firſt in ſmall doſes, as it is ready to irritate the ſtomach: and in ſeveral inſtances I have found it rejected by vomiting; and what is more extraordinary, I have known large doſes of it operate as a purgative. In urgent caſes, however, the doſes muſt be frequently repeated and increaſed, for it has been only from large quantities given, that its effects have appeared to be conſiderable. We begin by giving it in doſes of five grains; but have gone the length of a ſcruple, and have given ſuch a doſe ſeveral times in a day.

ALUM has been frequently employed in the Fluor albus, and particularly on the recommendation of Dr THOMSON, *Medical Eſſays*, IV. 38.; but I have been very often diſappointed of its effect.

IT was ſtrongly recommended by Dr MEAD for the cure of diabetes; but in our hoſpital the ſerum aluminoſum has been frequently employed in diabetes without ſucceſs.

AMONG the other remedies of intermittent fevers, alum joined with nutmeg has been mentioned; and the analogy with other tonic powers renders it a probable remedy. I have tried it by giving a large doſe of it an hour or a little more before the coming on of a paroxyſm; and in ſome inſtances it has prevented this: But both the alum and nutmeg were diſagreeable to the ſtomach, and prevented a repetition, when more agreeable and more certain medicines were at hand.

SINCE the time that HELVETIUS wrote *Des Pertes de Sang*, and propoſed alum as a ſpecific for the cure of theſe, it was long common to employ alum in the form propoſed by HELVETIUS, that is, as fuſed with a certain proportion of Sanguis draconis, ſuppoſed to be an aſtringent: but as this is a medicine not ſoluble in the human fluids, and therefore abſolutely inert, it has been juſtly rejected. If, as Dr LEWIS ſuppoſed it to be, more ſlowly diſſolved in the ſtomach, and therefore introducing the alum more gradually, it might be proper; but we are perſuaded that the Sanguis draconis rather prevented the operation of the alum altogether: and if the ſlow introduction is to be ſtudied, this may be obtained by ſmaller doſes than even thoſe above mentioned. The Edinburgh college have thought proper to continue the title of Pulvis Stypticus, that our practitioners had been long accuſtomed to; but they have added a more valuable aſtringent than the dragon's blood, that is, the gum Kino, which does not make in colour or doſe a medicine different from the compoſition formerly kept in the ſhops.

ALUM is more frequently uſed externally than internally, particularly in gargles, in relaxations of the uvula, and other ſwelling of the mucous membrane of the fauces, when there is not at the ſame time any acute inflammation preſent; but I have known it employed in every ſtate of the cynanche tonſillaris with ſome advantage. In many perſons who are liable to be affected with this ſwelling from ſlight applications of cold, we have known the diſeaſe prevented, or ſoon removed, by the uſe of a decoction of oak bark, to a pound of which half a dram of alum and two ounces of brandy were added. The ſame gargle, without the ſpirits, is uſeful in the caſe of ſpongy ſwelled gums and looſe teeth, from ſcurvy or other cauſes.

ALUM is alſo uſeful in curing the ophthalmia membranarum, and ſeems to me more powerful for this purpoſe than either white vitriol or ſugar of lead. It is commonly employed in the form of the coagulum aluminoſum; but I have found the ſolution in water to be ſtill more effectual, employing from two to five grains of alum to the ounce of water.

BURNT alum has been much employed as an eſcharotic for conſuming proud fleſh in ulcers; but it is not near ſo powerful as the preparations of either mercury or copper.

FERRUM ſive CHALYBS, *Iron* or *Steel*. The term Mars, introduced by the chemiſts, is very frequently employed.

BOTH titles ſtand in the catalogue of the London college: and in preparing the rubigo, they ſeem to have preferred the chalybs; but on what foundation we ca[illegible]t perceive. We ſuppoſe it to be quite indifferent whether the one or the other is employed; but if we were to give any preference, we ſhould think it due to the iron in its ſoft malleable ſtate, or in what we call Forged Iron.

As Iron, like all other metals, in its ſolid and entire ſtate, is not active with regard to our bodies, without being corroded or diſſolved by ſaline matters, ſo we judge it to be rendered active only by being combined with acids. It has been common enough to give the entire metal, brought by filing into a fine powder, and with very good effects, as a medicine. This, however, we do not conſider as any exception to our general rule: for we are perſuaded that there is conſtantly preſent in the human ſtomach a quantity of acid capable of diſſolving iron; and we hold this to be a proof of it, that we never knew iron given in its metallic or ſlightly corroded ſtate, without producing a blackneſs in the ſtools, which to us always preſumes a previous ſolution of the iron in acids.

As this combination with acids is neceſſary, ſo phyſicians and chemiſts have diverſified this combination a hundred ways: and we do not know a preparation of iron for the purpoſe of medicine that has not been prepared by a combination with acids, or by bringing the iron into a ſtate that rendered it readily ſoluble by the acid of the ſtomach; and Dr LEWIS very properly obſerves, that Pruſſian blue, though truly containing a quantity of iron, as it is not ſoluble in any acid, is the leaſt promiſing of all the medicinal preparations.

I DO not think it neceſſary to enumerate here the various preparations that have formerly ſtood, or ſtill ſtand, in our diſpenſatories, as they all agree in the ſame medical virtue, and are only proper as convenient for being exhibited in different forms. The Edinburgh college have endeavoured to make an improvement in preparing a ſpirituous tincture, as the tinctures of that kind formerly prepared were liable in keeping to let fall a portion of what they had diſſolved, and of thereby becoming conſtantly weaker the longer they were kept. The college, as taught by Dr BLACK, have obviated this, by ordering the tincture to be made of the ſquamæ ferri, as a portion of iron deprived of its phlogiſton, and therefore entering into a more ſtrict union with the acid.

IRON combined with acids becomes an aſtringent ſubſtance; and upon its aſtringent and tonic powers its medicinal virtues entirely depend: for by increaſing the tone of the veſſels it increaſes their vigour and activity.

WE do not think it neceſſary here to take any notice of the doctrine of MENGHINI concerning the iron conſtantly preſent in the blood of animals, or the manner in which it is introduced into it. We think it is enough to ſay, that his experiments, both on men and brutes, ſhow clearly that iron introduced into the ſtomach, and acting there, has the power of increaſing appetite, and the vigour of the circulation.

PHYSICIANS formerly ſuppoſed that iron had a double power of ſometimes increaſing and ſometimes reſtraining evacuations, and fancied that different preparations poſſeſſed theſe different powers: but in this they were miſtaken, as we have maintained above, that every preparation ſoluble in acids has the ſame aſtringent and tonic power; and the *Croci* which were diſtinguiſhed as aperient or aſtringent, have commonly neither the one nor the other quality.

IT is, however, ſtill true, that the ſame preparation, as Dr LEWIS has judiciouſly obſerved, may ſometimes exert an aperient and ſometimes an aſtringent power, according to the ſtate of the body they are applied to. If, for example, a retention of menſes depends upon a weakneſs in the veſſels of the uterus, chalybeate medicines, by invigorating the force of the veſſels, may cure the diſeaſe, and may thereby appear to be aperient: and, on the contrary, in a menorrhagia, when the diſeaſe depends upon a laxity of the extreme veſſels of the uterus, iron exhibited, by reſtoring the tone of theſe veſſels, may ſhow an aſtringent operation.

BY conſiderations of this kind, the inutility or propriety of the medicinal preparations of iron may be determined. In all caſes of active hemorrhagy, they muſt be hurtful; and in caſes of hemorrhagy from external violence, I would judge them to be uſeleſs, if not hurtful. In caſes of a general flaccidity, as it is frequently marked under the title of Cachexy, and in all caſes of evacuations from laxity, whether ſanguine or ſerous, they are likely to be the moſt effectual remedies.

WE are perſuaded that the good effects of the preparations of iron have been often miſſed by their being given in too ſmall doſes. The ſaline preparations, in large doſes, are ready to irritate the ſtomach; and both on this account, and on ſome other conſiderations, it may be always proper to begin with ſmall doſes, and to increaſe them by degrees: but we have often found, that no great benefit is to be obtained but when large quantities, either by the ſize of the doſes, or by the long continuance of them, have been thrown in. We have found the ſimple ruſt as effectual as any other preparation, and we have always found the ſtomach bear it better than any other. We begin with a doſe of five grains, but increaſe it gradually to what the ſtomach eaſily bears. We have been informed of its being given to the quantity of ſix drachms in one day; but we have hardly found any ſtomach that would bear the third part of that quantity without much ſickneſs. I think the ſtomach commonly bears it better by ſome aromatic being joined with it.

CUPRUM, *Copper*. By the chemiſts, *Venus*.

I HAVE no doubt of putting this metal into the liſt of aſtringents; for though it poſſeſſes very ſtrongly ſtimulant powers, which often prevent our perceiving its aſtringency, yet we can, by employing the milder preparations of it, or perhaps by preparing it ſo as to take away the whole of its ſtimulant quality, obtain its tonic effects.

THE late BARON VAN SWIETEN tells us, that he had met with a preparation of copper, in which the ſtimulant powers of it had been entirely taken away; and when taken into the ſtomach excited no nauſea, but excited a certain thrilling *formicationem* over the whole body, extending to the very points of the fingers; and this medicine had proved uſeful in epilepſies, which I think is the ſame thing as if he had ſaid it poſſeſſed a tonic power. I have not yet diſcovered the method of making ſuch a preparation of copper; and therefore I employ either a ſmall doſe of the blue vitriol or a combination of copper with ſal ammoniac, which I conſider as a milder preparation than the combination of the copper with an acid. I give the blue vitriol in the doſe of a quarter or half a grain according to the age of the perſon; and in repeating the medicine twice a-day, I increaſe the doſe to what the ſtomach will bear without vomiting, but allow it to go ſo far as to occaſion ſome ſickneſs and even nauſea. This medicine continued for ſome time, has proved an uſeful tonic in certain caſes of epilepſy and hyſteria. On ſome occaſions, it has proved diuretic; and on ſome others anthelmintic. The combination of copper with an ammoniacal ſalt, I learned from the *Acta Naturæ curios:* and firſt introduced it into the practice of this country; and it now ſtands in our Diſpenſatory under the title of the *Cuprum ammoniacum.* In many inſtances it has proved a cure of epilepſy, and thereby diſcovered its aſtringent and tonic power. It is employed in the ſame manner as I have ſaid above of the blue vitriol, by beginning with ſmall doſes of half a grain, and increaſing theſe by degrees to what the ſtomach will bear. I find it commonly more manageable than the blue vitriol; and in many inſtances have carried the doſe to five grains, and in ſome ſtill further. In many caſes it has proved a cure of epilepſy; but in many others it has entirely failed in being ſuch. When, in the courſe of a month, it has not ſhown any good effects, I deſiſt from its further uſe, as I ſuſpect that large quantities of copper introduced may, like lead, prove hurtful to the body: and therefore, in caſes of periodical epilepſy, after giving the medicine conſtantly during one interval, if the diſeaſe ſtill continues, I afterwards give the medicine only for ſome days before an expected acceſſion; and in this manner I have had ſucceſs.

IN uſing preparations of copper, we muſt conſult the various writings on the uſe of copper-veſſels in the kitchen. There have now been many publiſhed, and are well known. The facts they have related prove beyond a doubt, that copper introduced into the body to a certain quantity may prove very miſchievous, though their violent effects may not at firſt appear; but when they do appear they have been often fatal. What quantity of it is neceſſary to render it poiſonous, I cannot exactly determine; but I know that uſed in conſiderable quantity, in ſuch doſes as have been mentioned above, it has not diſcovered its deleterious effects: but at the ſame time, I am ſo well perſuaded of its deleterious tendency, that it ſeemed incumbent on me to give the caution I have juſt now mentioned; and its eſcharotic powers, when uſed externally, ſufficiently confirm my ſuſpicions.

THE eſcharotic powers of the preparations of copper have been known and employed from the moſt ancient times for cleanſing foul ulcers, and bringing them to diſcharge a laudable pus; but ſince the introduction of the uſe of mercury in the 16th century, the preparations of this have been more commonly employed. The operation of copper and mercury ſeem to be very much the ſame; and whether the one is preferable to the other, I cannot determine: but in ſome caſes I have found the copper ſucceed, when the mercury before employed had appeared leſs effectual; but whether this depended upon any peculiar power in the one ſubſtance more than in the other, or upon the different degree of acrimony in the different preparations employed, I am at a loſs to determine: but think the ſurgeons ought to attend more particularly to this ſubject.

WHEN the preparations of copper are applied to an entire ſurface, they manifeſtly diſcover an aſtringent power; and upon that footing they have been injected into the urethra in gonorrhœas and gleets; with what propriety it is not my buſineſs to determine here, the queſtion being with reſpect to aſtringents in general, and not with reſpect to copper in particular.

THE aſtringent powers of the preparations of copper have eſpecially appeared in the application of them to the eyes; and we have known a weak ſolution of verdegris uſeful in reſtraining inflammation: but it is ſo ready to prove irritating to that ſenſible organ, that a great deal of nicety is neceſſary in the employment of it; and we ſeem to have a milder preparation in the aqua ſapphirina. It is, however, abſurd to order this preparation in ſuch a manner as to allow the ſtrength of it to be liable to much uncertainty; and the Edinburgh college have properly ordered it ſo as it may be brought to a ſtandard. It has commonly been ſuppoſed, that the aqua ſapphirina was ſuited to take off ſpecks or opaque ſpots that appear upon the cornea, and which has been ſuppoſed to imply an eſcharotic power: but this certainly is ſeldom the caſe; and it ſeems to act only by an aſtringent power, diminiſhing the impetus of the fluids in the veſſels which terminate in the opaque ſpot.

IN another reſpect, the operation of the preparations of copper upon the eyes may be miſtaken. It has been common to introduce a portion of verdegris into the ointments which, in caſes of ophthalmia, are applied to the edges of the eye-lids; and this may be ſuppoſed to be on the footing of aſtringents: but as the application is eſpecially employed in caſes of the ophthalmia tarſi, in which there is almoſt always ſome excoriation of the tarſus, it is probable that the verdegris acts here as an eſcharotic.

PLUMBUM, *Lead.* Saturn.

THE aſtringent powers of the ſaline preparations of this metal are now ſufficiently aſcertained; but at the ſame time it is equally well known, that all theſe preparations, and the vapours exhaled from the metal itſelf, or its calces introduced into the body, diſcover a ſedative power extremely noxious to the human ſyſtem. It is therefore difficult to determine how far we can employ the aſtringent and tonic operation of this metal, and be at the ſame time ſecure againſt its deleterious powers, eſpecially as theſe deleterious powers do not always immediately diſcover their operation, and very often only after they have long remained latent and unheeded in the body.

THUS Dr HUNTDERMARK, formerly a Profeſſor at Leipſic, in the appendix to the 7th volume of the *Acta Naturæ curioſorum*, has given us a diſſertation *de ſacchari ſaturni uſu interno ſalutari*: and I have no doubt that the learned profeſſor had, upon ſome occaſions, found the ſaccharum ſaturni moderate the activity of the ſyſtem in fevers; for it appears that other preparations of lead had formerly been employed in fevers by other practitioners: but hardly any body now a-days will think, that Dr HUNTDERMARK, or thoſe other practitioners, were ſufficiently aware of, or attentive to, the conſequences to be apprehended; and therefore that they could warrant us in any caſe againſt theſe being very miſchievous.

THIS ſeems to be ſo much the caſe at preſent, that hardly any practitioner will now think of employing any preparations of lead as internal medicines: but in proportion as the favour for theſe has declined, that for its external uſe has greatly increaſed. We are, however, at a loſs to determine poſitively, what is its operation, or to explain in many caſes where its effects are evident, how the ſuppoſed operations could produce them. It is the writing of Mr GOULARD of Montpelier that has raiſed theſe doubts. It is difficult to deny facts poſitively aſſerted; but we find in GOULARD's writing ſo many facts not confirmed by our own experience, ſo many marks of partiality to the medicine he recommends, and ſo much frivolous theory by which he ſupports it; that his credit with me is indeed very little. I am much of opinion, that nobody can conſult him with ſafety, without attending to the very judicious and ingenious criticiſm publiſhed on the ſubject by Mr AIKEN of Warrington; and I am diſpoſed to leave my readers to be moſt properly informed of the virtues of lead applied externally in lotion, poultice, or ointment, to Mr AIKEN's work. I have only this to obſerve, that Mr AIKEN ſeems diſpoſed to think, that the ſaline preparations of lead externally applied, never enter into the ſyſtem in ſuch quantity as to affect the general ſyſtem in the ſame manner as they commonly do when introduced by the mouth, or when the vapours of lead are applied. But Dr Percival has given us a fact that may lead us to believe, that Dr Aiken's opinion is not well founded; and we judge it to be very probable, that though lead applied to the entire ſurface can hardly enter in ſuch quantity as to be noxious to the ſyſtem, yet that when applied to an ulcerated ſurface capable of a promiſcuous abſorption, it may be taken in in ſuch quantity as to affect the general ſyſtem.

Zincum, *Zinc*.

That the ſaline preparations of this metal act as aſtringents, we know very well from the operation of white vitriol, ſo very frequently applied to the eyes. It has been uſed in different proportions; and when in large proportions, it certainly proves very irritating: but it may certainly be uſed with great ſafety in a greater proportion than that of two grains to the ounce of water, as it is in the aqua vitriolica of the laſt edition of the Edinburgh diſpenſatory; and the London college ſeems to be of that opinion.

The flores zinci, as a matter liable to be corroded by the acid of the ſtomach, and thereby rendered active, has been lately, upon the authority of the late excellent Dr Gaubius, introduced into frequent practice as an antiſpaſmodic, or as I conſider it as an aſtringent and tonic. It has now been frequently employed here in epilepſy, hyſteria, and ſome other ſpaſmodic diſeaſes, as the chorea, and others. In epilepſy, they never anſwered with Dr Gaubius himſelf; nor have they, that I know of, here, though given in much larger does than he ſeems ever to have employed. In my own practice, I have not found them of remarkable benefit, nor do I find my fellow-practitioners giving a more favourable report; and in conſequence the employment

ployment of them in practice here becomes leſs and leſs every day.

IN remote parts of the country, in which the flores zinci were not to be had, I have frequently preſcribed the vitriolum album; and in ſome caſes with as good effect as in any of thoſe in which I had employed the flores zinci. We cannot diſmiſs the ſubject without obſerving, that from the experiments of Mr HELLOT, it appears clearly that zinc introduced into the body in a certain quantity may prove a violent poiſon; and I leave it with practitioners to conſider what caution this ſhould give in the large or long continued employment of zinc as a medicine.

VEGETABLE ASTRINGENTS.

THESE are a very numerous ſet; and in the indigene plants of Britain an aſtringent quality is very general. Formerly a great number of them were employed in medicine, and as ſuch ſtood in our diſpenſatory liſts: but the aſtringent quality is in different plants in very different degrees; and thoſe in which it is weak have been of late neglected in practice, and for that reaſon omitted in our liſts. For the ſame reaſon, perhaps, I might omit them here; but both becauſe their being omitted in practice is not always well founded, and becauſe they ſtill remain mentioned in materia medica writers of the lateſt date and beſt reputation, we ſhall think it neceſſary to take notice of ſome of them, if it were for no other purpoſe than to prevent ſtudents from being miſled by the materia medica writers they might otherwiſe conſult.

IN arranging the vegetable aſtringents, as in every other claſs of medicines, I have thrown them together, as far as I could, according to their botanical affinities; that is, as they belong to the natural orders, as theſe are eſtabliſhed by LINNÆUS or by Profeſſor MURRAY. Where that could not be properly done, I have done it by their ſenſible qualities, or ſome other analogies; all which will appear from the catalogue prefixed, and which will give a clear view of the order in which I am to purſue my ſubject. I begin the preſent with conſidering the natural order of the SENTICOSÆ; and taking theſe in the alphabetical order of the names under which they ſtand in pharmaceutical liſts, I begin with

AGRIMONIA.

THIS is now omitted both by the London and Edinburgh colleges, but in no other liſts that I have obſerved. It is ſtill in every materia medica writer; and theſe have always, and do ſtill favour it with more attention than we think it deſerves. It has ſome aſtringent powers; but they are feeble, and ſhould not hold the place of many which we know to be more powerful in every intention in which it has been, or could be, employed. If we did not know well the diſpoſition of the moſt judicious writers on the materia medica to repeat after others, we ſhould be ſurpriſed on finding Dr HALLER and Profeſſor MURRAY repeating after an author of ſo little credit as CHOMEL, that he had cured a ſchirrous liver by means of agrimony; and it ſeems equally frivolous in SPIELMANN to tell us, that FORRESTUS had by agrimony broke down a ſtone in the bladder, and brought it away in pieces with the urine.

I MAY have frequent occaſion for ſuch criticiſms; but I doubt much if my readers will have patience to admit of them.

ALCHEMILLA.

I HAVE inſerted this for the ſame reaſons I inſerted the above, though this has ſtill leſs than that pretenſions to a place any where; and I do not believe the authority of BALDINGER will again bring it into uſe.

ARGENTINA.

THE leaves of this intitle them to a place in a liſt of aſtringents; but their qualities are weak, and they are therefore properly neglected in practice. Upon the credit of TOURNEFORT, I have tried them in the fluor albus, but without ſucceſs. I did not indeed always join with them, as he did, the broth of crabs; but in ſome trials even with this my ſucceſs was no better. The roots are very different from all thoſe of the ſame order. They are more ſucculent, and have much ſweetneſs, with ſome aſtringency, but without any of the rank flavour of parſnips with which they have been frequently compared. From their ſaccharine ſtate, we might preſume upon their being nutritious; and they have been often eaten when boiled, and on ſome occaſions have ſupplied the want of other aliment. See LIGHTFOOT's *Flora Scotica.*

CARYOPHILLATA.

THE root of this is conſiderably aſtringent, with ſome aroma when it has been recently raiſed in the ſpring-ſeaſon and from a dry ſoil. The ſenſible qualities of this root are not, however, ſo great as to lead us to ſuppoſe its powers in the human body to be very conſiderable. But ſee how we may be deceived in this reſpect. A Daniſh phyſician, ſupported by the teſtimony of ſome of the moſt eminent phyſicians of that country, has repreſented the roots of the caryophillata as a powerful remedy in intermittent fevers: and beſides enumerating many caſes in which it had alone made a cure, he enumerates ſeveral in which it made a cure when the Peruvian bark had failed: And theſe experiments have been confirmed by that of other phyſicians in Germany and Sweden, particularly by WEBER profeſſor at Kiel.

THIS is all very ſtrong, and hardly any one at firſt ſight would doubt of it: but ſome ſcepticiſm is to be admitted in ſuch caſes. It is acknowledged even by BUCHAVE and WEBER, that this root failed in ſeveral inſtances where the Peruvian bark proved a remedy. The Swediſh experiments have not been ſo favourable as thoſe of the Danes and Germans to the credit of the caryophillata. With the former in very few inſtances it ſucceeded, and in very many it failed. Conſidering the fallacy of experience, and particularly the fallacy of the experiments given us by the inventors of new medicines, we muſt be doubtful of thoſe made by the partizans of the caryophillata, till further experience, free from the prejudices of the day, ſhall have been made, or till we ſhall have had a ſufficient opportunity of making experiments for ourſelves; which, from the ſcarcity of intermittents in this city, we have not yet had an opportunity of making.

FRAGARIA.

THE fruit of this plant has been, and will be, conſidered in another place. The virtues of the leaves and root, though the ſame with theſe of the order, are too inconſiderable to be taken notice of any where.

QUINQUEFOLIUM.

THIS is a plant ſuppoſed to have been known to HIPPOCRATES, and employed by him, as it has been frequently ſince by others, in the cure of intermittent fevers. On the ſame footing as of other aſtringents, we can readily admit of this; but the ſenſible qualities of the quinquefolium do not lead us to think that it is to be preferred, or that it is even equal to other plants of the ſame order.

ROSA.

THIS is of many different ſpecies, and the materia medica writers have treated of many of them in particular: but we can find little foundation for this; and it appears that thoſe writers, from their partiality to a fragrant flower, have beſtowed more attention upon the whole genus than their medical virtues deſerve. All the ſpecies diſcover an aſtringency which, agreeable to the principles of LINNÆUS on the ſubject of colours, is moſt conſiderable in the red roſe, and in theſe, as in their moſt auſtere ſtate, before they are quite blown. But even in their moſt perfect ſtate, the aſtringency is not ſo conſiderable as to give them much efficacy in practice. The infuſum and tinctura are elegant preparations; but their effects depend more upon the vitriolic acid added to them than upon the power of the roſes.

WITH reſpect to the roſes, the ſyrupus e roſis ſiccis is perhaps more powerful than the tincture. The practice has been to prepare this ſyrup with honey rather than ſugar; but we cannot find any advantage to ariſe from the honey. The laſt edition of the Swediſh pharmacopœia orders the mel roſaceum to be made without boiling; but that diminiſhes the aſtringent power of the medicine: and the pharmacopœia Danica neglect this power altogether, when they order the medicine to be made with the diſtilled water. Vinegar can hardly be impregnated with the aſtringent quality of roſes; and we think the acetum roſaceum to be hardly of more power than the ſimple vinegar.

THE virtue of roſes is ſuppoſed to be found eſpecially in the conſerve made of them; and it is ſufficiently probable that they will have the greateſt effect when they are given in ſubſtance, and in conſiderable quantity. Some ſtrong teſtimonies are given of their effects in phthiſical caſes; and it is not improbable that aſtringents internally given may contribute to the cure of certain ulcers: but we muſt own that it is in few inſtances only that we have ſeen the conſiderable effects of the conſerve of roſes in caſes of phthiſis pulmonalis: and in the caſes in which we have ſuppoſed it uſeful, it has always been joined with a diet of milk and farinacea, and gentle exerciſe in the open air. So that it was uncertain how much was to be imputed to the roſes: and this we think was alſo the caſe with CRUGER, living upon barley-water and wheaten bread alone. We are clearly of opinion with Profeſſor MURRAY, that a ſmaller proportion of ſugar would improve it as a medicine; that inſtead of three parts of ſugar to one of roſes, as in our diſpenſatory, it would be better with an equal part only as in the Swediſh; with one and a half as in the Ruſſian; or at moſt with two parts as in the Daniſh pharmacopœia.

If any of the ſpecies have any purgative quality, it is very inconſiderable; and the ſyrup prepared upon this ſuppoſition does not at all deſerve the place it has ſo long had in our ſhops. The cordial and analeptic powers ſo often celebrated in roſes, are entirely on the footing of other grateful odours, to be taken notice of elſewhere.

The fruit of the roſa ſilveſtris is commonly taken notice of under the general title of Roſa; but that is not agreeable to our plan, and muſt be taken notice of elſewhere: but there is a production of the roſe-plant, a fungus or gall growing upon it, known under the name of *Bedeguar*, which belongs to the title of aſtringents, as it is poſſeſſed of and celebrated for its aſtringent power; but it has hardly yet got a place in our diſpenſatories, and we are quite unacquainted with its powers.

TORMENTILLA.

This root, by its ſenſible qualities, and by its ſtriking black with green vitriol, appears to be one of the ſtrongeſt aſtringents of this order; and therefore it has been juſtly commended for every virtue that is competent to aſtringents. I myſelf have had ſeveral inſtances of its virtues in this reſpect; and particularly I have found it, both by itſelf and as joined with gentian, cure intermittent fevers; but it muſt be given in ſubſtance and in large quantities.

STELLATÆ.

APARINE.

This formerly ſtood in our diſpenſatory liſts, but is now omitted in all thoſe in which any correction has been attempted, and ſeemingly with great propriety. We expect, however, that at leaſt materia medica writers will excuſe us if we repeat any facts which have been aſſerted: and therefore I inform my readers, that GIROLAMO GASPARI, a phyſician at Feltri, publiſhed at Venice in the year 1731 a ſmall volume under the title of *Nuove et eruditi Oſſervazioni Mediche*: in which he tells us he had employed the aparine in ſcrophulous tumours and ſores with great ſucceſs, and that he had heard of others who had done the ſame; but this practice has not been taken notice of or confirmed by any other writers that I know of; and in ſome trials that I have myſelf made, it has been of no ſervice.

GALIUM.

THE flowers of the Galium luteum have an agreeable odour, and their taſte very gently acid and aſtringent; but I am uncertain if what grows in this country is the ſame with what grows elſewhere. The acidity and aſtringency of our plants is very inconſiderable; and no pains which Dr YOUNG or I could take, found them to coagulate milk; and BERGIUS, in the Swediſh plant, neither found any acidity, nor found it in three ſeveral trials to coagulate milk. He tells us alſo, in contradiction to BORRICHIUS, that in diſtillation it afforded no acid; but I imagine his experiment was different from that of BORRICHIUS, as this was without addition, whilſt that of BERGIUS was with the addition of water. In the latter kind of diſtillations, an acid does not immediately ariſe, as it does in the former from almoſt every vegetable; and if BORRICHIUS found an acid ariſe more readily from the galium than from the acetoſa, we would aſcribe it to the ſucculency of the latter, as plants give out always firſt their more purely aqueous parts.

WITH reſpect to the virtues of the flowers of the galium in epilepſy, though it has been aſſerted by ſeveral, I am very doubtful of its power; and in ſeveral trials they have entirely diſappointed me.

RUBIA TINCTORUM.

THE ſenſible qualities of this root do not give any favourable opinion of its medical virtues; and till lately it has not been much employed in practice: but within theſe fifty years, it has become very remarkable for its effect in giving its colour to the bones of animals who are fed upon it. This, with its giving colour alſo to the milk and urine of animals, ſhows that its colouring matter is carried into the maſs of blood in conſiderable quantity, and diſtributed through every part of the ſyſtem; and if we can ſuppoſe any active powers in ſuch a matter, the circumſtances mentioned would lead us to believe, that a matter ſo largely applied might be a very powerful medicine. We do not, however, find, that theſe powers have been yet aſcertained; and the effects that large quantities of this root given to brute animals have in producing great diſorders in their ſyſtem, muſt render us doubtful of its general ſalutary tendency. That it may promote urine, we can believe from the teſtimony of many authors; but at the ſame time from my own experience I can aſſert, that, in many trials for this and other purpoſes, ſuch an effect is not conſtant, nor has ever occurred to me.

As to its power and utility in the cure of jaundice, though it was employed by SYDENHAM, and formerly by the Edinburgh college, we pay no regard to it; conſidering the fallacy which has ſo generally taken place with reſpect to the medicines employed in this diſeaſe. As it takes ſo readily to the bones, it is ſpeciouſly enough ſuppoſed that it might particularly operate upon theſe; and accordingly it has been recommended as a remedy in rickets, particularly by ſome French writers, who are with me of very doubtful authority. It does not, however, ſeem to have been known to the Italian practitioners, nor to Dr BOERHAAVE, nor to his commentator: and in ſeveral trials we have ſeen made with it, its effects have not at all been evident. Of late it has come into ſome repute as an emmenagogue; and I have received ſome teſtimonies of its effects as ſuch from ſome phyſicians of this country, whoſe judgment I very much reſpect; but in all the trials that I have made with it, it has failed: and I know of other practitioners in this country, who, after ſeveral ineffectual trials made with it, have now entirely deſerted its uſe.

VAGINALES.

ACETOSA.

THE acid juice found in the leaves of this plant is to be conſidered in another place; and it is the root only that can have a place here. This has ſome aſtringency, but too little to be employed in practice, where ſo many more powerful are readily to be had.

LAPATHUM.

UNDER this title the leaves and roots of a number of different plants have been employed; and in their qualities and virtues approach nearly to one another. In the leaves there is more or leſs of acid, which we are to conſider in another place; and in their roots there is more or leſs of aſtringency, which gives them a place here. Which of them are the moſt powerful aſtringents, we find it difficult to determine. Dr ALSTON's account of the hydrolapathum is very ſtrong, and appears to be well founded; but we know little of their employment in practice. The laxative quality, ſuppoſed to be in ſome of them, we know from trial to be very inconſiderable; and the virtues of the oxylapathum for the cure of the itch, we know alſo from trials to be none at all. The decoction may, like that of other aſtringents, be uſefully employed in waſhing old ulcers; but the lapathum does not appear to have any peculiar power in this reſpect.

BISTORTA.

THIS, both by its ſenſible qualities and by the colour it gives with green vitriol, and by the extracts it affords, ſeems to be one of the ſtrongeſt of our vegetable aſtringents, and is juſtly commended for every virtue that has been aſcribed to any other. As ſuch we have frequently employed it, and particularly in intermittent fevers, and in larger doſes than thoſe commonly mentioned in materia medica writers. Both by itſelf and along with gentian, we have given it to the quantity of three drachms in one day.

FORMERLY the rheum ſtood in our liſt in this place; but as it is hardly ever employed for the ſole purpoſe of aſtringency, and always or chiefly for its purgative quality, I have now referred it to what I think its proper place.

FILICES.

THESE comprehending what have been called the Capillary plants, form a natural order in botany, and in medicine ſhow the power of a natural order, by having very much the ſame virtues. I have ſet down only two or three which had lately a place in our diſpenſatory liſts, though in moſt of thoſe of later date they are omitted.

Asplenium.

The ſeveral ſpecies of this ſhow a ſlight aſtringency; for which, however, they do not deſerve to be employed. In other reſpects they ſhow no active powers; and there is nothing more ridiculous than their having been ſo long conſidered as pectorals.

Filex Mas.

The root of this plant has been long celebrated as an anthelmintic, but its ſenſible qualities do not promiſe much; and as it has hardly ever been employed but with ſome draſtic purgatives, it is therefore to me ſtill doubtful if it has any ſpecific power in killing worms either of one kind or another. We more readily enter into this opinion, becauſe in ſeveral trials of it made in this country in caſes of worms, the ſtomach bears conſiderable quantities of it without any uneaſineſs; but when given by itſelf, it had no ſenſible effects.

Acerba.

I have ſet down a number of fruits that agree in their ſenſible qualities; which are ſuch as lead me to give them a place here among the aſtringents. They might alſo have had a place amongſt the nutrientia; but they are very ſeldom brought to our tables; and if at all employed, it is in medicine as aſtringent ſubſtances.

This country affords few of them; and therefore of ſeveral of them I have no exact knowledge of their qualities: but this country affords one of the moſt powerful of the whole, and that is the Prunus Silvestris, which I have often found an agreeable and uſeful aſtringent. It was formerly prepared as an inſpiſſated juice; but as in that ſtate it is leſs ſoluble and leſs readily active, the preparation of it has been properly changed into the form of a conſerve; but I muſt remark, that in this both Colleges have in my opinion employed a larger proportion of ſugar than is any ways neceſſary.

SUCCI INSPISSATI.

UNDER this title I had formerly ſet down two particulars, the ACACIA and HYPOCISTUS, which are now no longer known in our ſhops, and they ſeem to be properly neglected, as by the accounts given of them they ſeem to have no peculiar properties; and their power as aſtringents is no greater than what we can find in other ſubſtances more within our reach.

TERRA SAPONICA.

THE production of this drug, formerly not well aſcertained, is now put beyond all doubt by the labours of the ingenious Mr KER. See *London Medical Obſervations* vol. v. p. 148. This ſubſtance is ſtill frequently employed in practice, entering into ſeveral officinal compoſitions; and we judge it, when genuine, to be a powerful aſtringent: but whether it is ſo much more powerful than ſeveral Britiſh ſubſtances, as to engage us to employ this brought from a diſtant country, and very liable to be adulterated, we cannot poſitively determine.

MR KER informs us, that this ſubſtance forms a conſiderable part of an ointment very much uſed in Indoſtan. The other ingredients of that compoſition are conſiderably aſtringent; and the whole leads me to make this reflection, that aſtringents are more frequently uſeful and neceſſary in ulcers than our ſurgeons have commonly thought: and that the uſe of them ſo frequently commended by materia medica writers is not upon ſuch a ſlight foundation as I have formerly been ready to imagine.

SANGUIS DRACONIS.

THIS I have left ſtanding in my liſt, becauſe it remains ſtill in all our diſpenſatory liſts, though it ſeems very doubtful if it deſerves a place. As it is abſolutely inſoluble in watery menſtruums, it may be doubted if it be ſoluble in the animal fluids: and though it may be diſſolved in ſpirits, and thus introduced into the ſtomach, the aqueous fluids which it meets with there muſt immediately precipitate it into an inert ſubſtance. We are therefore upon the whole, clear, that it ſhould be expunged from our materia medica liſt. See what we have ſaid above in the article of Alum upon the ſubject of the Pulvis Stypticus.

KINO.

THIS is a new acquiſition to the materia medica; and it has been adopted by the Edinburgh college as an officinal, but by no other college that I yet know of.

WE are informed by Dr FOTHERGILL, that it is a gum which exſudes from inciſions made in the trunks of a certain tree called Pau de Sangue, growing in the inland parts of Africa; but the botanical account of this tree we have not yet met with.

BOTH by its ſenſible qualities, and by its ſtriking black with a ſolution of green vitriol, we have grounds for ſuppoſing it a powerful aſtringent: and we have found it prove to be ſuch in ſeveral inſtances of diarrhœa. I am informed alſo by a good hand, of its having been uſeful in ſome uterine hemorrhagies, particularly thoſe after child-bearing. In ſome caſes of fluor albus I have been diſappointed of its effects when employed by itſelf; but the Edinburgh college have properly joined it with alum in the pulvis ſtypticus: and this compoſition proves one of the moſt powerful aſtringents I have ever employed. We are clear that, in making the tincture, the kino may be taken in larger proportion than it is in the diſpenſatory. As we have this gum, it is in large proportion ſoluble both in watery and ſpirituous menſtruums. The brandy tincture ordered by the Edinburgh college is a ſufficiently agreeable and powerful medicine; but in many caſes the menſtruum prevents its being given ſo largely as it may be in ſubſtance or in watery infuſions.

CORTICES.

THE aſtringent quality of vegetables is more frequently lodged in their barks than in any other part of them; and there are perhaps very few barks of a hard conſiſtence in which there is not more or leſs of an aſtringent quality. This quality, however, is often joined with others of a more active kind, which prevents their being uſed as aſtringents; and I have therefore ſet down in my liſt only a few in which a ſimple aſtringency prevails, and that of a powerful kind.

CORTEX GRANATORUM.

THE ſtrong ſtyptic taſte of this bark, and the black colour it ſtrikes with green vitriol, ſhow ſufficiently its aſtringent power; and it is commonly ſuppoſed to be among the ſtrongeſt of this kind. As at the ſame time it gives out ſuch a large portion of its ſubſtance to water in infuſion or decoction, it ſeems to be particularly fit for affording a liquid aſtringent; and I have frequently found it particularly uſeful in gargles, in diarrhœa, and in external applications. That it is ſo powerful an aſtringent internally uſed as to be more dangerous than others I cannot perceive; and that it has ever had the power of ſuppreſſing the menſes in females ſeems to me very doubtful.

CORTEX QUERCI.

THIS is the bark that is conſidered as the moſt powerful of the vegetable aſtringents; and its univerſal uſe and preference in the tanning of leather renders the opinion very probable. Accordingly it has been much employed as an aſtringent medicine, and commended for every virtue that has been aſcribed to aſtringents either internally or externally employed; but except its degree of power it has no peculiar qualities to diſtinguiſh it from other aſtringents. I have frequently employed the decoction with advantage in ſlight tumefactions of the mucous membrane of the fauces; and in ſeveral perſons liable upon a ſlight application of cold to a prolapſus uvulæ, and a cynanche tonſillaris. In many caſes this decoction, early applied, has appeared uſeful in preventing thoſe diſorders which otherwiſe were wont to ariſe to a conſiderable degree. I have indeed almoſt conſtantly joined a portion of alum to theſe decoctions; but I have frequently found that a ſolution of alum alone, of the ſtrength it could be conveniently employed in, did not prove ſo effectual.

I HAVE employed the oak-bark in powder, giving it to the quantity of half a dram every two or three hours during the intermiſſions of a fever; and, both by itſelf and joined with camomile flowers, have prevented the return of the paroxyſms of intermittents.

ALL theſe virtues, in a conſiderable degree, are found to belong to the cupulæ or ſcaly cup which embraces the bottom of the acorns.

GALLÆ.

ALTHOUGH theſe ſubſtances are the work of animal, we conſider them as entirely of a vegetable, nature, and put them here immediately after the oak bark, as they are an excreſcence from the ſame tree, and a ſubſtance of the ſame qualities with the bark we have been juſt now treating of. It is ſuppoſed to be the moſt powerful of vegetable aſtringents; and I am ready to believe it to be ſo, though it has not been employed ſo often, or in ſuch a variety of caſes, as many others have been. About the beginning of this century, in ſome parts of France the Gallæ had got a reputation for the cure of intermittent fevers; and it was pointed out as a proper object of attention to the Academy of Sciences; who accordingly appointed Mr POUPART to inquire into the matter. His report may be ſeen in the Memoirs for the year 1702. It amounts to this, that in many caſes the galls cured the intermittents; but that it failed alſo in many caſes in which the Peruvian bark proved effectual. BERGIUS is of opinion, that the practice with the galls is very miſchievous; but in employing them with gentian or other bitters I met with no bad conſequences.

IN this country of late a particular uſe of galls has prevailed. Finely powdered, and mixed with eight times their quantity of hog's lard, they are made into an ointment; which, applied to the anus, has been found to relieve hemorrhoidal affections; and we have known ſome inſtances of its being uſeful.

As, however, it has been more frequently employed by the vulgar than by the advice of our phyſicians and ſurgeons, we cannot ſay how far it has been univerſally ſafe; but ſo far as I can learn, it has not been commonly hurtful: and there is reaſon to believe it to have been certainly uſeful in the caſes of Exania, that is, in caſes of a topical rather than of a ſyſtematic affection.

VISCUS.

THOUGH it is pretty certainly eſtabliſhed that the miſletoe does not differ in its qualities from a difference of the trees on which it grows, yet if it was to be mentioned at all, I thought beſt to do it in this place, as it is almoſt always the viſcus quernus that has been pointed out by writers.

ALTHOUGH, upon the recommendation of COLBATCH, this plant was not very long ago in high repute for the cure of epilepſy, his facts have ſo entirely loſt their credit, that it is entirely omitted both by the London and Edinburgh colleges. As ſtill, however, remaining in the liſts of ſeveral of the lately improved pharmacopœias, we have given it a place here. It is, however, only to ſay, that from its ſenſible qualities, and from ſeveral trials made with it in practice, that it ſeems to be a ſubſtance of very little power in medicine.

I AM ſurpriſed at Dr HALLER's quoting ſo many authors for the accounts of its virtues; and humbly think that he might not only have omitted the report of its effects againſt the power of witchcraft, but alſo many of the others which he quotes.

LIGNUM CAMPECHENSE.

THIS wood is of a conſiderably aſtringent quality, and its uſe in dyeing is a ſufficient proof of it. It has not, however, been employed except in the caſe of fluxes, and it is alleged to have been very uſeful in dyſenteries: but we judge this to have been at the end of theſe only, when the diſeaſe was in the ſtate of diarrhœa; for it was from the employment of this very medicine in the beginning of dyſenteries, that I learned what miſchief aroſe from the uſe of aſtringents in the beginning of that diſeaſe.

IT is employed in decoction or in extract; and it was in both ſhapes that I obſerved it to have the effects juſt now mentioned. Dr ALSTON has given this opinion, that if the lignum campechenſe be uſeful in fluxes, it is not by its aſtringency: but upon what that opinion was founded I cannot perceive; for it is certainly an aſtringent, and I cannot diſcover any other quality in it by which it can be medicinal.

IN the table of medicines which I made out for my lectures on the materia medica, and which was publiſhed with the ſpurious edition of thoſe lectures, after throwing the aſtringents into aſſortments as well as I could, I ſet down a number of ſubſtances which I could not refer to any general heads; and I was then, like many other perſons, treating of the materia medica, willing to multiply my ſubjects: but now, not willing to admit any but thoſe of ſome power and efficacy, I have omitted a great number of my former liſt; ſuch as the *Anchuſa*, *Brunella*, *Hypericum*, *Plantago*, *Sanicula*, and *Sedum*, as not deſerving a place here. Some of the others, as the *Millefolium* and *Uva Urſi*, I refer to other titles; and therefore of my former liſt there remain only the few following to be taken notice of here.

BALAUSTIA.

THESE flowers diſcover no other quality than that of aſtringent; but they ſhow this in a conſiderable degree. I am, however, of BERGIUS's opinion, that they are leſs powerful than the bark of the fruit.

LYTHRUM.

THIS has been hardly known as a medicine till the late Dr DE HAEN publiſhed his experience of it in his *Ratio Medendi*. His teſtimony in its favour is very ſtrong, and it is confirmed by ſome others. Mark, however, the fallacy of experiment: Profeſſor MURRAY found it uſeful in the caſe of lientery; but in other caſes it ſeems frequently to have failed: and HEUERMAN, in employing the flowers, found it rather to increaſe the diarrhœa, and otherwiſe to raiſe ſo much diſorder, that he ceaſed to employ them. From the ſenſible qualities of the whole, either with reſpect to aſtringency or mucilage, I would not expect much from it; and from ſome trials made, I have no opinion of its efficacy.

AFTER thus enumerating particular aſtringents, I have ſet down in my liſt ſome general titles of medicines that have a place elſewhere, but which may be, or are ſuppoſed to be, uſeful as aſtringents. And, in the firſt place,

ACIDS *as Aſtringents.*

ACIDS have a very various and complicated operation, according to their different degrees of concentration, which will be conſidered when we come to treat of them in their proper place; and here we are only to view them as they belong to our preſent title of aſtringents.

ACIDS, under a certain degree of concentration, as they coagulate the fluids, ſo they harden the ſolids compoſed of theſe, and thus prove aſtringent. Whether, however, the aſtringency which they ſhow even in a very diluted ſtate depends upon their coagulating power, I dare not aſſert; for they certainly ſhow it in a ſtate in which they do not coagulate the fluids. Although, from the effect of vinegar upon the lips, we can readily diſcover their aſtringent power, yet how this is conſiſtent with a ſtimulant power, which the ſame ſtate of acid alſo ſhows, we cannot readily ſay, but ſhall conſider it hereafter.

THE aſtringent power which acids exert upon the veſſels of the ſkin is ſuppoſed to go deeper, and to affect the ſubjacent muſcular fibres ſo far as to be uſeful in recovering the relaxation and weakneſs that takes place in the caſe of ſprains. I believe, however, that their operation in this caſe is only by a communication from the veſſels of the ſkin to thoſe of the ſubjacent parts; by which they are uſeful in preventing the afflux of fluids to the part, and the tumour that would thence ariſe; and it is in this manner that they are particularly uſeful in contuſions.

THE acid commonly employed for theſe purpoſes is vinegar: but whether a more concentrated acid might not be employed, I cannot certainly determine. From ſome trials, however, I am diſpoſed to judge that the foſſil acids under a certain degree of dilution might be employed with advantage.

IN another view, acids are ſuppoſed to act as aſtringents, as they are employed internally for reſtraining hemorrhagy, and practitioners have frequently found them in this manner uſeful. But conſidering the quantities in which only they can be introduced, we cannot ſuppoſe that they are ſo diſtributed in the maſs of blood as that they can act as aſtringents upon the open blood-veſſels; and therefore their effects here muſt be aſcribed to their refrigerant power, to be conſidered more fully hereafter.

ALTHOUGH not mentioned in my preſent catalogue, there are ſome titles given in that annexed to the ſpurious edition of my lectures which it may be proper to repeat here.

AUSTERE WINES.

THIS title only leads me to obſerve, that acids joined to aſtringents produce the qualities of auſtere and acerb, and in certain caſes ſeem to increaſe the aſtringency. Wines, therefore, which have ſome auſterity, are juſtly ſuppoſed to be more aſtringent than the ſmooth and ſweet wines. From hence there may be a choice of wines in certain caſes of diſeaſe; but the aſtringent power of wines can never be conſiderable, and muſt be generally counteracted by the alcohol that is at the ſame time preſent. It is therefore that, to obtain the aſtringent virtue of wines, they muſt be expoſed to ſuch a heat as may diſſipate their alcohol while their aſtringent matter remains; and thus what are called Burnt Wines, joined with the aromatic aſtringency of cinnamon, ſometimes prove an uſeful medicine.

BITTERS *as Aſtringents.*

BITTERS certainly do ſometimes ſhow the effects of aſtringents, and therefore I judge it proper to mention them here; but how far they are, or in what manner they act, as aſtringents, I refer to be conſidered in my next chapter, which is to treat of tonic medicines.

SEDATIVES *as Aſtringents.*

EVERY body knows that ſedatives, and particularly opium, are employed in reſtraining exceſſive evacuations; and therefore this has been ſuppoſed, and frequently ſpoken of, as an aſtringent: Certainly, however, neither in opium, nor in any other narcotic ſedative, can any aſtringent quality be diſcerned; and there is hardly any doubt that their operation in reſtraining exceſſive evacuations is entirely by ſuſpending the irritability and action of thoſe moving fibres, whoſe increaſed action produced the evacuation. How far they are properly employed in place of the proper aſtringents, I ſhall conſider hereafter under the title of Sedatives.

THERE is another kind of ſedatives which are frequently employed for reſtraining exceſſive hæmorrhagy, and might therefore alſo be conſidered as aſtringents. Theſe are the ſeveral neutral ſalts, and particularly nitre; all of which I am to conſider hereafter under the title of Refrigerants. In the mean time it will be plain, that their operation in reſtraining hemorrhagy cannot be aſcribed to any aſtringent quality, which they do not in any way diſcover, but muſt be owing to their general power of diminiſhing the activity of the ſanguiferous ſyſtem, which we ſhall conſider in its proper place.

BALSAMICS *as Aſtringents.*

BALSAMICS have been employed for reſtraining the evacuations that occur in gonorrhœas, gleets, and fluor albus, and therefore ſhow the effects of aſtringents. It will be obvious, however, that they do not this by any proper aſtringent power; and in what manner they do it, I ſhall endeavour to explain in its proper place hereafter.

CHAPTER II.

OF TONICS.

THE treating of theſe here breaks in upon our general plan of conſidering ſeparately the medicines which act upon the ſimple ſolids, and thoſe which act upon the nerves and moving fibres; but I have found that ſuch a plan could not conſiſtently, or with advantage, be every where followed, and that in ſome inſtances it would be better to conſider medicines by the affinity of their effects rather than by their manner of operating.

IT is this that has led me, after conſidering aſtringents, to treat here of tonic medicines; which, by giving firmneſs and ſtrength to the whole ſyſtem, and thereby to particular parts, have an effect analogous and ſimilar to that of aſtringents: and I ſhall have occaſion to obſerve, that by the aſtringent and tonic power combined, ſome of the moſt valuable purpoſes of both are with greater certainty to be obtained.

WE enter, therefore, now upon the conſideration of tonics: and ſhall, in the firſt place, inquire a little into their manner of operating; in the next place, conſider the effects that are in common to a great number of them; and, in the third place, treat of the pharmaceutic treatment and adminiſtration which may alſo be in common to many of them. After all this, I ſhall enumerate the chief of the ſubſtances that may be referred to this head, in order to determine in what degree they poſſeſs the general properties, or what may be peculiar to each of them.

We have already taken pains to ſhow that the tone of the moving fibres may depend partly on the mechaniſm of theſe fibres, but probably alſo upon the inherent power or ſtate of the nervous fluid, as particularly modified in thoſe fibres. If this laſt poſition be well founded, it will follow that, whilſt on different occaſions the tone of the moving fibres may be ſtronger or weaker, this may depend upon the ſtate of the nervous power in the moving fibres being for the time different; and as this power may be acted upon and variouſly changed by ſubſtances applied to the body, we may allow that there are ſubſtances which, applied to the moving fibres, may induce that ſtate of the nervous power upon which their tone depends.

Astringents, we have obſerved, prove often tonics with regard to the moving fibres; and it will be readily preſumed, that they have that effect by acting upon the ſolid part of the fibre: but we ſhall find, that there are tonic medicines which diſcover no aſtringent quality; and therefore their action muſt be upon the inherent power.

These are the ſubſtances which are eſpecially to be called Tonics: and I now proceed to inquire what theſe ſubſtances properly are.

WITH reſpect to this, it appears pretty clearly, that the tonic power of ſubſtances is chiefly the ſame quality that gives them their bitter taſte: for, except the aſtringents, I know no other ſubſtances poſſeſſed of tonic power but the bitters. Theſe indeed have frequently other qualities combined with the bitter, as that of aromatic, ſaline, narcotic, purgative, or otherwiſe variouſly ſtimulant; and theſe other qualities are often ſo prevalent in the compoſition of certain ſubſtances as to prevent our employing their bitter quality as a tonic: but we can, upon many occaſions, diſtinguiſh the bitter from all theſe other qualities, and find that the pureſt bitter, or what is free from all other qualities, is poſſeſſed of a conſiderable tonic power: And therefore we conclude, that except in ſo far as aſtringents may be ſuch, the proper tonics are the bitters, and perhaps theſe only. We go on, therefore, now to conſider them as ſuch.

BITTERNESS is a ſimple perception that cannot be defined, but muſt be referred to a matter of experience in which mankind are commonly agreed. What is the nature of the ſubſtances poſſeſſed of it in a chemical view we cannot determine, or at leaſt we can only in a negative way diſtinguiſh it from other matters.

THUS we can ſay, that bitterneſs does not depend upon any volatile parts, for the pureſt and ſtrongeſt bitters have no ſmell; and if there are ſome bitters which give a ſmell, that again is commonly loſt on drying, while the bitter taſte and quality remain entire.

IN another view, the bitters are without volatile parts, as the pureſt kinds of them give out in diſtillation no eſſential oil; or if ſome of them do, the oils are without bitterneſs, and ſhow very clearly, that the bitterneſs of the entire ſubſtance did not depend upon the eſſential oil in their compoſition.

WE learn alſo otherwiſe, that bitterneſs does not depend upon any ſuch oil in the compoſition of their ſubſtance, as ſome of the ſtrongeſt bitters are quite free from any acrid or aromatic quality.

NEITHER can I find any thing diſtinctly ſaline in the compoſition of bitters. There are hardly any of them which to our taſte diſcover any ſaline matter except in a few ſubſtances, in which ſome acid happens to be conjoined; but the ſtrongeſt bitters are abſolutely free from any ſuch quality: and ſo far are acids from entering into the compoſition of the bitter, that we ſhall hereafter ſhow the combination of acid to have a tendency to deſtroy the bitter quality. With reſpect to any other ſaline matters to be alleged in the compoſition of bitters, it is true, that, by particular proceſſes, ſaline matters can be extracted from bitter ſubſtances; but as theſe ſaline ſubſtances are not extracted, but produced by a deſtruction of the original mixture, and as nobody has ſhown that the ſaline matters are in any certain proportion to the bitterneſs of the ſubject, or that they modify it in any certain manner, we cannot make uſe of any ſuch analyſis in explaining the natural compoſition of bitters.

UPON the whole, I muſt allege, that in a chemical view, we cannot explain the nature of bitters It is a compoſition *ſui generis*, that we can in many caſes diſtinguiſh from all others; and if in any caſe we have learned to change its condition, it is from particular experience, and not from any knowledge of its conſtituent parts.

BEFORE we enter upon what experience has taught in this reſpect, it will be proper to conſider the various purpoſes in medicine to which bitters may be applied. And as in this view the bitters in their operation on the human body have many of them the ſame qualities and virtues in common, we think it may be uſeful to conſider, in the firſt place, what theſe common qualities are.

FIRST, then, the moſt obvious operation of bitters is, that being taken into the ſtomach, they increaſe the appetite for food, and promote the digeſtion of it. But we take it for granted, that theſe functions depend upon the tone of the muſcular fibres of the ſtomach; and therefore may ſuppoſe, that the improvement of theſe functions depends upon an increaſe of tone in thoſe fibres. And farther, as loſs of appetite and indigeſtion can often be diſtinctly perceived to occur from a loſs of tone in the ſtomach; ſo bitters, as they are often effectual in curing theſe diſorders, may be preſumed to do it by reſtoring the tone of this organ.

THE correcting the acidity and flatulence of the ſtomach, may be aſcribed to the power of bitters in checking aceſcent fermentation, which they do out of the body; and the relieving the ſtomach from abundant mucus or phlegm, as it is called, may be aſcribed to the power of bitters in diſſolving viſcid animal fluids. As it is, however, probable that both the prevalence of an aceſcent fermentation in the ſtomach, and a ſuperabundance of mucus in it, are commonly owing to a loſs of tone; ſo the correction of thoſe diſorders may be aſcribed more properly to the tonic power of bitters with reſpect to the human body than to their chemical qualities.

THERE is, then, hardly any doubt, that bitters are powerful tonics with reſpect to the ſtomach; and therebeing as little doubt, that the ſtate of the ſtomach is commonly communicated to the other parts of the ſyſtem: ſo it is ſufficiently probable, that by an improvement of digeſtion, the vigour of the ſyſtem may be in general improved; and that alſo the tone, and conſequently the activity of the whole of the moving fibres, may be increaſed.

IT has been commonly ſuppoſed, that bitters are uſeful in reſolving viſceral obſtructions: and if they ſhall be found to do ſo, I would maintain that they have no conſiderable operation upon the ſtate of the fluids, and therefore that their effects in curing viſceral obſtructions muſt be aſcribed entirely to their tonic power; although it may not be improper by the way to remark here, that in all caſes where I could find the exiſtence of viſceral obſtructions well aſcertained, I have ſeldom or never found any benefit from bitters though largely employed.

ON the ſame occaſions that materia medica writers recommend bitters as uſeful in viſceral obſtructions, they particularly recommend and extol their uſe in the jaundice: but that the judgment of theſe writers in this matter is fallacious, we have endeavoured already to ſhow.

IN ſpeaking of the power of tonics in reſolving viſceral obſtructions, we muſt obſerve, that upon the tonic power of bitters in ſtrengthening every where the extremities of the veſſels is founded their utility, ſo frequently reported in the cure of dropſy. As this diſeaſe ſo frequently depends upon a loſs of tone in the whole ſyſtem, which gives the ſtate of cachexy, and thereby that laxity of the exhalants which conſtitutes the hydropic diatheſis; ſo if ſuch a ſtate does not depend upon ſome conſiderable and fixed viſceral obſtructions, it is obvious, that our tonic bitters may be of great ſervice, may obviate a coming on dropſy, or even cure it when formed.

IT has been alleged, that bitters ſometimes operate as diuretics. And as the matter of them appears to be often carried to the kidneys, and to change the ſtate of the urine, ſo it is poſſible, that in ſome caſes they may increaſe the ſecretion: but in many trials we have never found their operation in this way to be manifeſt, or at leaſt to be any ways conſiderable. In one ſituation, however, it may have appeared to be ſo. When in dropſy, bitters moderate that exhalation into the cavities which forms the diſeaſe, there muſt neceſſarily be a greater portion of ſerum carried to the kidney; and thereby bitters may, without increaſing the action of the kidney, ſeem to increaſe the ſecretion of urine.

THAT the tonic power of bitters in the ſtomach is communicated to the other, and even the moſt diſtant parts of the ſyſtem, appears ſtrongly from their being a cure of intermittent fevers, and a ſpecial means of preventing the return of their paroxyſms.

I HAVE explained elſewhere, and need not repeat here my opinion, that the recurrence of the paroxyſms of intermittent fevers depends upon the recurrence of an atony in the extremities of the arterial ſyſtem. It is from hence accordingly that the recurrence of paroxyſms is prevented by ſtimulants and by aſtringents; and if the ſame is alſo done by bitters, it muſt be by a tonic power communicated from the ſtomach to the moſt diſtant parts of the ſyſtem. In this caſe, however, the bitters do not act as ſtimulants, for they do not increaſe the frequency of the pulſe, nor the force of the circulation; nor do they act as aſtringents, becauſe they do not always poſſeſs any ſuch quality; and therefore they muſt in ſuch caſes act purely as tonics.

To prove the operation of tonics in curing intermittents to be an operation on the nervous ſyſtem, we maintain it to be a communication from the ſtomach; for their effects, after being taken in, often appear ſooner than they can be ſuppoſed to be carried further than into the ſtomach, and certainly ſooner than the quantity employed can be diſtributed, ſo as to have any local effects on the parts affected by the morbid ſtate.

IT may be remarked here, that the effects of bitters are more certainly obtained by their being combined with aſtringents, which, however, does not derogate from the power of the ſimple bitter; for from my own experience, as well as from the report of other writers, I know that the moſt pure and ſimple bitters are often ſufficient for the purpoſe.

THEY are by ſome writers ſaid to have been uſeful in continued fevers; and if theſe fevers have been of the putrid kind, and attended with great debility, we may readily allow the fact; and that ſome reports of their having been uſeful even in the plague itſelf are probably well founded.

THEIR uſe, however, in continued fevers is ſomewhat ambiguous, as tonic medicines muſt promote the phlogiſtic diatheſis of the ſyſtem; and therefore, wherever ſuch diatheſis prevails, our tonics muſt be hurtful.

BITTERS have been ſometimes ſpoken of as ſudorifics; and though they do not ſtimulate the ſanguiferous ſyſtem, yet as they invigorate the force of this ſyſtem, they muſt determine it more fully to the ſurface of the body, and probably ſupport perſpiration; but ſo far as I can perceive, they never occaſion ſweating, except by the aſſiſtance of a ſudorific regimen, that is, by their being taken in a very diluted ſtate, conſiderably warm, and in conſiderable quantity, while the perſon lies a-bed cloſely covered up.

IN mentioning the operation of bitters on the ſtomach, I ſhould have taken notice of their effects when further carried on in the alimentary canal. And with reſpect to theſe, it may be obſerved, that we have always found a large doſe of bitters prove pretty certainly laxative; and this, with the analogy from bile, makes me judge, that bitters, beſides their tonic power, have a peculiar power of ſtimulating the inteſtinal canal: and, therefore, that they may be uſeful, as is alleged, in ſpaſmodic colics or in diſpoſitions to that diſeaſe, and particularly that they may be uſeful in dyſentery; in which ſome conſtriction of the inteſtines taking place, renders purgatives and laxatives ſo generally neceſſary.

ANOTHER virtue aſcribed to bitters is their proving emmenagogue; but I have never perceived that they had any ſpecific power determining them to the uterus. In caſes of chloroſis, their tonic power is certainly uſeful; but I have never known that theſe alone afford a cure.

SEVERAL writers take notice of bitters in general, and of ſome of them more particularly, as reſolving the coagulations produced by falls and contuſions; but as we do not believe in their power of changing the ſtate of the fluids, ſo we cannot truſt to their operation in this caſe; and I have not met with any experience to eſtabliſh it.

THERE remains only one operation of bitters internally employed; and that is their proving anthelmintic, and a poiſon for worms. There is one inſtance reported of their even mitigating the pains ariſing from a tænia; but we do not find any account of their ever expelling that kind of worm. It is ſaid to be the lumbrici teretes to which they are eſpecially adapted; but from REDIS's experiments it appears, that bitters are not an immediate poiſon to thoſe animals; and Profeſſor MURRAY properly obſerves, that if the ſemen ſantonicum, according to BAGLIVI's experiments, operates more quickly, it muſt be by ſomething elſe than its bitterneſs that this ſeed operates. I am uncertain if I have ever been poſſeſſed of the beſt kind of this ſeed; but muſt ſay, that what I have ſeen has hardly ever appeared to me to be a powerful medicine.

AFTER conſidering, in ſo many inſtances, the internal uſe of bitters, we muſt obſerve, that they have alſo their virtues when externally employed. They have been commended for cleanſing and healing foul ulcers; and in that way we have found them uſeful. They are certainly antiſeptic, though not of the moſt powerful kind; but in checking the progreſs of gangrene, they have often been uſeful.

THEY are univerſally employed in fomentations for diſcuſſing tumours; but in caſes where the ſkin is entire, the more pure bitters which have no volatile parts can hardly be of much ſervice. It is therefore the bitter joined with ſome aromatic parts in their compoſition which only can be uſeful here; and if even theſe can do much more than warmth and moiſture alone, is with me very doubtful.

THE operation of bitters hitherto conſidered ſeem, ſo far as they go, to be tolerably explained: but there is an effect of them ſtill to be mentioned which gives more difficulty; and that is, their being a cure of the gout that has been often aſcribed to them.

THE fact is certain; and there are accounts from the time of GALEN to the preſent, which ſhow that the uſe of bitters, ſuch for example as the Portland powder continued for ſome time, has prevented the return of paroxyſms of inflammatory gout, which had before, in the ſame perſons, been frequent: but in what manner they do this is truly difficult to explain.

THE pathology of the gout under its various ſtates and circumſtances is truly a difficult ſubject; and except it be Dr STAHL and his followers, all other phyſicians, very univerſally attached to a humoral pathology, have ſuppoſed the gout to depend upon a peculiar morbific matter preſent in the body; which, however, is neither proved in fact nor explains the phenomena of the diſeaſe.

IN my *Firſt Lines* I have given a different view of the ſubject; but am afraid that, to the moſt part of phyſicians little attentive to the motions of the nervous ſyſtem, I have involved the ſubject in ſtill greater obſcurity. I cannot indeed obviate this here; but well perſuaded of the truth of the general doctrine, ſhall try it, by endeavouring to explain in what manner bitters operate in ſeemingly curing the gout.

I BELIEVE it to be very evident to every body, that the phenomena of the gout have a conſtant connection with the ſtate of the ſtomach, and particularly that a certain ſtrength of tone in this organ is neceſſary to produce a paroxyſm of inflammatory gout. At the ſame time, however, I am of opinion with Dr SYDENHAM, that every paroxyſm of inflammatory gout is introduced by a ſtate of atony in the ſtomach. How this atony gives occaſion to the recovery and exertion of tone I cannot indeed explain; but as it appears in fact to be ſo, I would allege, that though the previous atony be a neceſſary ſtep in the ſeries of phenomena, it is only when in a moderate degree, and may be eaſily overcome by the *vis medicatrix naturæ;* but that if the atony go to a certain greater degree, no inflammatory paroxyſm enſues; and the perſon remains in that ſtate which I have called the atonic gout; and it ſeems as if bitters, long continued in uſe, actually produce this greater degree of atony, ſo that they prevent inflammatory paroxyſms.

THIS is the explanation I would give of their effects in this way; but I own it is difficult to explain how bitters, which are otherwiſe in ſo many caſes the moſt powerful tonics, ſhould have in this a contrary operation. Without venturing, however, to offer any theory of this, I reſt upon it as a matter of fact, that bitters actually deſtroy the tone of the ſtomach. I dare not determine, whether the loſs of tone mentioned is produced merely by the repetition of their tonic operation, or by a narcotic quality which has been ſuſpected in wormwood and other bitters, and which appears pretty ſtrongly from the poiſonous quality that is found in the ſtrongeſt bitter we are acquainted with; that is, the Faba Sti Ignatii. I am truly of opinion, that ſomewhat deleterious in the whole of the bitters is to be ſuſpected. But I proſecute this ſubject no farther here; and ſhall rather enter upon a queſtion of more importance, which is, to determine whether this remedy for curing the gout can be ſafely employed.

ON this ſubject it appears clearly, that, from very ancient times down to the preſent, ſuch a medicine has at different periods been recommended and employed for the gout; and as always on its firſt coming into uſe, it ſeems to have been of ſervice, it might have been expected, that if it had not in its conſequences been found hurtful, the uſe of it ſhould have been continued with every gouty perſon; ſo that this diſeaſe ſhould have long ago ceaſed to be one of the *opprobria medicorum.* We find, however, that whilſt at one period it has been in high favour, at another it ſeems to have been entirely neglected; and this I can only impute either to its often failing or to its being often attended with conſequences more grievous than the pains of the gout. That the latter was the caſe, we may preſume from the accounts of the ancients, who, though they recommend the remedy in certain conſtitutions as highly uſeful, allow that in other caſes it had been highly pernicious; and in this reſpect I would take the account of COELIUS AURELIANUS, as quoted by Dr CLEPHANE, to be very general.

THE effects of it in modern times have been very much upon the ſame footing. It is poſſible that ſeveral perſons may have taken the Portland powder, and other bitters, with ſeeming great advantage; but I have not had opportunity to know the ſequel of the whole of ſuch perſons lives, ſo as to ſay poſitively how far in any caſe the cure continued ſteady for a life of ſome years after, or what accidents happened to their health.

BUT I have had occaſion to know or to be exactly informed of the fate of nine or ten perſons who had taken this medicine for the time preſcribed, which is two years. Theſe perſons had been liable for ſome years before to have a fit of a regular or very painful inflammatory gout, once at leaſt, and frequently twice, in the courſe of a year: but after they had taken the medicine for ſome time, they were quite free from any fit of inflammatory gout; and particularly, when they had completed the courſe preſcribed, had never a regular fit, or any inflammation of the extremities, for the reſt of their life.

In no inſtance, however, that I have known, was the health of theſe perſons tolerably entire. Soon after finiſhing the courſe of their medicine, they became valetudinary in different ſhapes; and particularly were much affected with dyſpeptic, and what are called nervous complaints, with lowneſs of ſpirits. In every one of them, before a year had paſſed after finiſhing the courſe of the powders, ſome hydropic ſymptoms appeared, which gradually increaſing in the form of an aſcites or hydrothorax, eſpecially the latter joined with anaſarca, in leſs than two or at moſt three years, proved fatal. Theſe accidents happening to perſons of ſome rank, became very generally known in this country, and has prevented all ſuch experiments ſince. In illuſtration and confirmation of all this, ſee Dr CLEPHANE's Obſervations in London Med. Obſerv. vol. i. art. 14. Chirurgical Pharmacy, page 341. HALLERI Epiſtola, vol. v. p. 5 . and GAUBIUS in the Works of the Harlem Society, vol. iv.

Before quitting the ſubject of the gout, we muſt remark, that in many writers on the materia medica, reports are to be found of benefit received from bitters in caſes of ſtone and gravel. I have never tried them with that view; but from the affinity that ſubſiſts between the gout and ſtone, I can readily believe, that the bitters that are found for ſome time to prevent the paroxyſms of the gout, may alſo prevent paroxyſms of the ſtone.

AFTER having thus conſidered the general virtues of bitters, I am to offer ſome general remarks with reſpect to their adminiſtration and pharmaceutic treatment.

THE medicinal part of bitters of every kind may be extracted by either watery or ſpirituous menſtruums, and ſuch extractions may have the virtues of the ſubſtance from which they have been taken: but I maintain, that hardly in any caſe they ever have it in the ſame degree; and that, wherever it can be admitted, the bitter in ſubſtance is the moſt effectual, and in ſome caſes the only effectual, mode of exhibiting it. This every body knows to be the caſe with the Peruvian bark; and I have found the ſame to be the caſe in all my attempts to ſubſtitute other bitters in place of that bark.

THERE are caſes, indeed, in which the ſtomach will not bear either the bark or bitters in ſubſtance, and therefore it becomes often neceſſary to obtain their virtues in a liquid form; in the management of which, however, ſeveral particulars demand attention.

BY infuſion in water, and even in cold water, bitters give out their virtues; but to cold water they never give a ſtrong impregnation, though it be generally the moſt agreeable to the palate and ſtomach. Warm water, though under the boiling heat, extracts more powerfully than cold, and the more as its temperature is warmer. With reſpect to every temperature, this is eſpecially to be attended to, that by infuſion bitters ſuffer a gradual decompoſition, and conſequently the matter extracted is different according to the length of time that the menſtruum has been applied; ſo that the temperature being given, what is extracted in the firſt hours is a lighter and more agreeable matter than what is extracted after many hours infuſion.

THIS we have tried with ſeveral bitters, infuſing the ſame quantities of the bitter in the ſame quantity of water, and ſetting all of them in the ſame degree of heat for ſix, for twelve, for twenty-four, and for forty-eight, hours. In every experiment, it appeared that the impregnation was ſtronger according to the length of time employed in infuſion, and at the ſame time that the harſhneſs of the taſte was ſenſibly increaſed. This, however, was remarked, that the difference of the impregnation was not ſo remarkable in the longer infuſions as in the ſhorter; and therefore the impregnation did not appear in the forty-eight hours ſo much in proportion ſtronger than that of twenty-four hours, or ſo great as that of twenty-four compared with that of ſix. On the other hand, it appeared that the harſhneſs of taſte increaſed according as the infuſion was longer; and therefore the harſhneſs of taſte was not ſo much increaſed from the twenty-four hours above that of ſix, as it was in the forty-eight hours infuſion above that of twenty-four. From all this we conclude, that an infuſion of twenty-four hours is ſufficient for impregnation, and that little harſhneſs will be produced by infuſions of a ſhorter time; and therefore a ſufficiently uſeful, and the moſt agreeable, infuſion of bitters, in cold water, or even of warm water under the boiling heat, will be that of twenty-four hours, or perhaps leſs. The London college, in limiting their infuſions even of boiling water to a ſingle hour, ſeem to be more nice than is neceſſary.

THE treatment of bitters by cold infuſion in wine, is, with reſpect to extraction, much on the ſame footing with the treatment by water. It does not appear that wine extracts the medicinal qualities more powerfully than water, or in any inſtance gives a more efficacious medicine, excepting where the wine concurs in the intention of it as a medicine. It is, therefore, almoſt only for the purpoſe of a more agreeable medicine that bitters are infuſed in wine.

A STILL more powerful extraction is made of bitters by a boiling heat; and here alſo the ſame difference ariſes from the length of time employed in decoction. With reſpect to bitters, it is certain that decoction extracts more powerfully than infuſion: but by diſſipating any aromatic parts that were joined with the bitter, and by extracting more of the earthy part, and what may be called a coarſer bitter, decoctions are always more diſagreeable than infuſions; and therefore what we call extracts, which are always prepared by decoction, are always leſs agreeable to the ſtomach than the bitter in ſubſtance. It appears to me that decoction decompoſes the ſubſtance of what is extracted; for it is ſeldom that decoctions do not upon cooling depoſite a part of what they had ſuſpended before, and that alſo a matter different from the entire ſubſtance. What is exactly the nature of the matter impregnating decoction, has not been duly examined; but we ſay no more of that here, as it is pretty certain that bitters are never treated by decoction, ſo as to be either agreeable or very uſeful medicines.

BESIDES the ordinary treatment by infuſion or decoction, bitters may be treated by the application of water in two other ways. One is, by what I call a Trituration, in the manner of the COMTE DE LA GARAYE. In this practice, the ſubſtance is broken down into very minute parts; but ſo far as I can perceive, without any decompoſition or diviſion of its conſtituent parts.

THE only ſeparation which ſeems to be made is that of the more ſoluble from thoſe of a firmer texture; and ſo far as theſe more ſoluble parts poſſeſs the medicinal qualities of the ſubject, they are obtained very entirely, and that in a ſtate more than any other agreeable to the human ſtomach. They ſeem to be much in the ſame ſtate as they are obtained by an infuſion in cold water; which by a proper evaporation affords the ſame ſort of matter that is obtained by the COMTE DE LA GARAYE's apparatus. In either way, we may obtain an efficacious and an agreeable medicine; but it is to be doubted if the expence incurred in the preparation will ever allow it to come into much uſe.

THE other management of the application of water different from the common, is that by the uſe of a digeſter. Decoctions are commonly made in open veſſels, or in veſſels not ſo accurately cloſed as to prevent the diſſipation of volatile parts; but this can be obviated by the uſe of a Digeſter: and though in the glaſs digeſter we employ, the heat applied can be conveniently no more than that of boiling water, yet we find that medicinal ſubſtances can be extracted by this apparatus as powerfully as by decoction, and with this advantage, that the volatile parts which either were a part of the ſubſtance that is to be extracted, or were added to it for the purpoſe of rendering it a more agreeable or a more effectual medicine.

BITTERS are univerſally extracted by ſpirit of wine, and even by a proof-ſpirit, not ſo largely indeed for the moſt part as by water, but in moſt inſtances their medicinal parts are extracted more purely; and the tinctures, when they can be employed in tolerable quantity, ſeem to be more efficacious medicines than any infuſions or decoctions in water.

WITH reſpect to the tinctures made with a proof-ſpirit, the ſame things are to be obſerved as of thoſe made with water, that there is a gradual decompoſition of the ſubſtance, and therefore that the tinctures made by a ſhort infuſion are more agreeable than thoſe that have ſtood longer. It ſhould have been obſerved before, that a ſpirituous menſtruum extracts thoſe bitters that have any aromatic joined with them, more entirely and effectually than is done by water; but in obtaining the ſpirituous extract, if this be done by drawing off the ſpirit by diſtillation, this advantage is commonly entirely loſt.

WITH reſpect to both the extractions by water and by ſpirit, this is to be remarked, that the moſt agreeablebitter is to be obtained by a ſhort infuſion; and a ſtronger impregnation of the ſame agreeable bitter is only to be got by a repeated cohobation of the ſame menſtruum upon freſh parcels of the ſame material.

THIS further is to be remarked, that watery infuſions, if made tolerably ſtrong, prove very diſagreeable; and the employment of the tinctures with rectified ſpirit will always be limited by the menſtruum; and therefore the tinctures made with proof-ſpirit will always give the moſt convenient extraction: and I have found that the employing a digeſter for brandy tinctures makes a more powerful extraction than can be got by long infuſion, and that with very little trouble.

HAVING now ſaid what relates to bitters in general, we proceed to examine how far the general virtues prevail in the particulars of our liſt, or under what peculiar modifications they are to be found.

PARTICULAR BITTERS.

GENTIAN.

I BEGIN with this root becauſe I find it to be a moſt ſimple and pure bitter, more perfectly free from any of that aromatic or aſtringent quality which is ſo frequently conjoined with others: At the ſame time it is a pretty ſtrong bitter, and has every virtue that has been aſcribed to bitters in general, which we have detailed above.

IT has been at all times, and ſtill is, much employed in medicine: and with reſpect to its pharmaceutic treatment and adminiſtration, every thing that we have ſaid above with reſpect to bitters in general is applicable to this. There is ſome variety in the formulæ; but the differences are of no importance. Dr WHYTE's tincture has been juſtly commended; but the virtues of it depend more upon the Peruvian bark than upon the gentian.

THE febrifuge virtues of gentian have by ſome writers been made equal to thoſe of the Peruvian bark: but in many caſes the gentian alone has fallen ſhort of that; but joined with galls or tormentil in equal parts, and given in ſufficient quantity, it has not failed in any intermittents of this country in which I have tried it.

A MEDICINE has been long famous and much employed in this country under the title of STOUGHTON's Elixir. The preſent elixir ſtomachicum, or tinctura amara of the laſt editions of the Edinburgh diſpenſatory, reſemble it very exactly, and I am certain has all the virtues of it. This, however, as Dr SHAW has adviſed, may be further improved, by pouring the tincture upon a freſh parcel of the materials in half the quantity of thoſe firſt employed.

THERE has been ſome queſtion about the ſpecies of gentian moſt fit to be employed. The gentiana lutea is choſen by the Britiſh diſpenſatory; but if in Germany they employ the gentiana rubra, it will make very little difference. In Norway they employ the gentiana purpurea, and perhaps with advantage. For ſome time paſt we have had the root of this ſpecies imported into this country under the title of Curſuta, ſo named from the Norwegian name of it Skarſote. Some perſons have thought it a ſtronger bitter than the common gentian, or root of the gentiana lutea: but I know of no experiments made for proving this; and it appears to me in its ſenſible qualities to be very much the ſame with the common gentian.

CENTAURIUM MINUS.

As this is a ſpecies of gentian, it has the virtues of the genus, and has been commended for all the ſame qualities as gentian or other bitters. The centaury, therefore, is not very ſcientifically introduced, as commonly done, into the ſame compoſitions with the gentians. Profeſſor MURRAY properly obſerves, that as an indigenous plant it may be properly preferred to a foreign drug; but I find it inconvenient to employ the centaury, as in an equal weight it takes up more of the menſtruum than the root of the gentian: and if it is to be taken out by expreſſion, it ſpoils the elegance of the infuſion or tincture. Dr LEWIS has juſtly obſerved that the petals are inſipid, or at leaſt have very little bitterneſs; and it is therefore improperly that the ſummitates are commonly preſcribed. It is ſaid that the extract of this plant is leſs agreeable than that of gentian; but I find no difference between them, and think it ſhould be conſtantly ſubſtituted for that of gentian, as it may be more cheaply prepared.

QUASSIA.

WE can find nothing in this wood but a pure and ſimple bitter. In ſeveral ſpecimens I have found the bitterneſs to be pretty ſtrong; but for the moſt part it is, to my taſte, not more bitter than the columba, nor even than good gentian. We are obliged to Profeſſor MURRAY for his compilation on the ſubject of quaſſia; but after all that has been ſaid by him and Mr EBELING, we find hardly any virtues aſcribed to quaſſia which have not been to other bitters. Upon the whole, I believe quaſſia to be an excellent bitter, and that it will do all that any pure and ſimple bitter can do: but our experience of it in this country does not lead us to think it will do more; and the extraordinary commendations given of it are to be aſcribed to the partiality ſo often ſhown to new medicines, and eſpecially by thoſe who firſt introduce them, and by thoſe who have a connection with the country from whence they are brought.

SIMARUBA.

I INSERT this here, partly becauſe it is a ſpecies of the ſame genus with the preceding article, and partly, but eſpecially, becauſe it ſeems to be very nearly of the ſame qualities; for we can perceive nothing in it but that of a pure and ſimple bitter.

THE virtues aſcribed to it in dyſentery have not been confirmed by my experience or that of the practitioners of this country; and leaving what others are ſaid to have experienced to be further examined and conſidered by practitioners, I can only at preſent ſay, that my account of the effect of bitters in the dyſentery will perhaps explain the virtues aſcribed to the ſimaruba. In dyſentery, I have found an infuſion of camomile flowers a more uſeful remedy.

MENYANTHES.

THIS is a ſtrong bitter, without diſcovering either by taſte or ſmell any peculiar acrimony combined with it. Its juice ſtrikes a black colour with the ſolution of green vitriol, which implies ſome aſtringency; but the ſame is not diſcovered by the taſte or any of its effects. We conſider it as a very pure bitter; and as it is of a ſtrong kind, we ſuppoſe it to have all the virtues that have been aſcribed to any other bitters; though upon account of its ſtrong taſte, it is leſs agreeable than ſome others.

DR ALSTON's obſervation on this plant deſerves to be remarked: "I knew it (he ſays) to have very remarkable effects in the "gout in keeping off the paroxyſms, though not to the pa-"tient's advantage." This is to be collated with, and added to, what we have ſaid above on the uſe of bitters in curing the gout.

THIS plant has been ſaid to loſe its ſtrength by drying; but that ſeems to be a miſtake, for I have often, and moſt commonly, uſed it in its dry ſtate with all the advantages I could expect.

I HAVE had ſeveral inſtances of its good effects in ſome cutaneous diſeaſes, of the herpetic or ſeemingly cancerous kind. It was taken by infuſion in the manner of tea.

CARDUUS BENEDICTUS.

THIS is a ſimple and very pure bitter, but not a very ſtrong one, and has therefore none of the extraordinary virtues that have been aſcribed to it. It is ſaid to be extracted moſt agreeably by infuſion in cold water; but I find that boiling water, if not applied above twenty-four hours, makes it hardly leſs agreeable, and is much ſtronger than the former.

LUPULUS.

THIS is a pure and ſimple bitter, though not without ſomething odorous and aromatic in the flowers, which are the parts employed. Their uſe in preparing malt liquors is well known. The ſame effect of preſerving theſe liquors for a long time without aceſcency may be obtained by other bitters; but none of them are ſo agreeable as the hop. This might alſo be agreeably employed in medicine; but we have no particular experience of its uſe.

FABA STI IGNATII.

THIS is the moſt intenſe bitter we are acquainted with, and in a very ſmall doſe it has the effect of curing intermittent fevers. Whether it operates as a pure bitter, or as having combined with it a narcotic power, I will not determine; but we have mentioned this in another place as an example of ſuch a combination, and as a ground for ſuſpicion that all the bitters have more or leſs of a narcotic quality. However this may be, our preſent ſubject belongs to a genus of poiſonous plants, and is therefore hardly to be employed where any ſafer remedies are known.

FUMARIA.

THIS is not commonly enumerated among the bitters; but it deſerves to be ſo, for this is its only ſenſible quality: and though it is more diſagreeable than many others, it is without acrimony or aſtringency. It is omitted in the London diſpenſatory, but retained in ours, and in every other that I know of. I have found it uſeful in many caſes in which bitters are preſcribed; but its remarkable virtues are thoſe of clearing the ſkin of many diſorders. For this it has been much commended; and I have myſelf experienced its good effects in many inſtances of cutaneous affections, which I would call Lepra. I have commonly uſed it by expreſſing the juice, and giving that to two ounces twice a-day: but I find the virtues remain in the dried plant, ſo that they may be extracted by infuſion or decoction in water; and the foreign diſpenſatories have prepared an extract of it to which they aſcribe all the virtues of the freſh plant.

IT has been frequently obſerved with reſpect to this extract, that after being kept for ſome time it ſhows a cryſtallization upon its ſurface, which is a ſaline matter of the nitrous kind, and this in much larger proportion than in any of the other bitter extracts. Whether this contributes to its peculiar virtues, I leave it to the learned to determine.

ÇOLUMBO.

THIS is a root that we have become acquainted with within theſe forty years; and ſince the account given of it by the learned Dr PERCIVAL, it has come to be frequently employed in practice. When firſt brought into Holland, it was introduced as a remedy in dyſentery; and both in Holland and in Germany it was employed in that diſeaſe with much commendation. Dr PERCIVAL informs us, that he had ſometimes found it uſeful in dyſentery; but he does not ſpeak of it as of much importance in that diſeaſe: and ſo far as I can learn, the employment of it in that way has not prevailed in Britain.

I FIND this root to be a ſtrong and agreeable bitter, and have employed it in many inſtances of dyſpepſia with great advantage. In ſtopping vomiting it has frequently anſwered, but in many it has failed entirely; and even in caſes where there ſeemed to be a redundancy of bile. With reſpect to its peculiar power of changing the acrimony, or correcting the putreſcency of the bile which Dr PERCIVAL aſcribes to it, neither the experiments of EBELING in his diſſertation on the quaſſia, nor ſome that I have made, ſhow it to be more powerful than other bitters; and therefore do not allow me to think it has any ſpecific power in that reſpect.

CHAMÆMELUM.

UNDER this title we have two plants whoſe flowers are employed, as marked in our liſt; and there is ſome queſtion which ought to be preferred. The virtues are preciſely of the ſame kind; but I have always judged the Roman or double-flowering camomile to be the ſtrongeſt: and if any regard is to be had to the eſſential oil, this certainly affords the greateſt quantity; and I am informed, that in warmer climates where it is a native, the qualities of it are much ſtronger than with us.

THESE flowers have been long celebrated as ſtomachics; and I have found them anſwer both in powder and in infuſion the purpoſes of any other bitters. Before the introduction of the Peruvian bark, they were much employed in the cure of intermittent

mittent fevers; and our celebrated countryman Dr PITCAIRN was of opinion, that their powers in this reſpect were equal to thoſe of the Peruvian bark.

HOFFMAN ſeems to have thought them a very effectual, and at the ſame time a ſafer, remedy. I have accordingly employed them; and agreeable to the method of HOFFMAN, by giving, ſeveral times during the intermiſſion, from half a dram to a dram of the flowers in powder, have cured intermittent fevers. I have found, however, that theſe flowers were attended with this inconvenience, that, given in a large quantity, they readily run off by ſtool, defeating thereby the purpoſe of preventing the return of paroxyſms; and I have found, indeed, that without joining with them an opiate or an aſtringent, I could not commonly employ them.

THIS quality of the camomile in moving the inteſtines renders them often uſeful in flatulent and ſpaſmodic colic; and upon the ſame ground I have found them uſeful in dyſentery, and rather hurtful in diarrhœa.

TANACETUM.

BOTH the herb and flowers have been employed, but the herb is the ſtronger of the two, and may be employed for any of the purpoſes of bitters, but does not ſeem to be near ſo ſtrong a bitter as camomile and ſeveral others already mentioned. It had almoſt gone out of uſe, till lately it was again brought into practice as a powerful remedy againſt the gout; and as ſuch was employed by many perſons in this country. I was not living in this city when the caſes occurred to Dr CLARK, which he mentions in the Phyſical and Literary Eſſays, nor have I learned what was the fate of theſe perſons afterwards; but I have ſince learned, or have been informed, of many perſons of this city, who have drank of Tanſy tea as a remedy for the gout. Of theſe, however, I have known ſeveral who have taken it without any advantage, and ſome others who reported that they had been relieved from the frequency of their gout: but I know of none who have employed it in ſuch quantity, or for ſuch a length of time, as might lead me to expect thoſe conſequences which I have mentioned before as following the uſe of the Portland powder.

Absynthium.

This is one of the moſt famous among the bitter plants, and has been uſed with much commendation for every purpoſe of bitters. It is an odorous plant, and gives out in diſtillation an eſſential oil which, however, has not any bitterneſs; and therefore cannot be ſuppoſed to contribute any thing to the effect of the plant. When indeed it is entirely diſſipated in making the extract, this retains all the bitterneſs of the plant; and, in my opinion, all the virtues depending upon it. Some phyſicians make a choice among the ſpecies, and prefer the Romanum or Ponticum to the Abſynthium vulgare; but the Edinburgh college are of opinion, that there is no foundation for this; and that the abſynthium vulgare, as the more powerful bitter, is always to be preferred. They have erred, however, in preſcribing the ſummitates, as I truly find the leaves to afford a ſtronger bitter than the flower and tops. In the tinctura abſynthii, the college have given an example of the proper treatment of bitters in order to obtain a lighter and more agreeable bitter, and at the ſame time a ſtronger impregnation. I am of opinion, that they ſhould have employed the ſame management in other caſes; but in the example of wormwood, they have allowed both infuſions, eſpecially the ſecond, to be for too long a time. The pharmacopœia Roſſica has copied exactly that of Edinburgh, and has very properly directed the other bitter tinctures of carduus benedictus and centaury to be made upon the ſame plan of double infuſion. In the pharmacopœia Danica, the eſſentia abſynthii is too much and injudiciouſly compounded. Neither the pharmacopœia Danica, in adding the zedoary, nor the Swediſh, in adding the galanga, to their bitter tinctures, have in my opinion judged very properly. With reſpect to the abſynthium, there is a queſtion, whether it is imbued with any narcotic power? LINDENSTOLPE, and his commentator STENZELIUS, have aſſerted it very ſtrongly; but there ſeems to have been a peculiar idioſyncraſy in the inſtances they mention; and we ſhould not mind their account, if the ſame opinion of its narcotic power had not been alſo delivered by ſome others.

ON the other hand, however, LINNÆUS informs us, that perſons taking wormwood every day for ſix months together, obſerved no ſuch narcotic effects. I have not had an opportunity of making proper experiments; but to me, with BERGIUS and GLEDITSCH, the odour of wormwood ſeems temulentans, that is, giving ſome confuſion of head: and formerly when it was a faſhion with ſome people in this country to drink PURL, that is, ale in which wormwood was infuſed, it was commonly alleged to be more intoxicating than other ales. This effect is improperly ſuppoſed to be owing to its volatile parts, for the reaſons I have given above: but I am more ready to admit the general doctrine of a narcotic power, as I believe from ſeveral conſiderations, particularly from the hiſtory of the Portland powder, that there is in every bitter, when largely employed, a power of deſtroying the ſenſibility and irritability of the nervous power.

To wormwood, as to every other bitter, has been aſcribed an anthelmintic virtue; and this has been ſuppoſed to be more conſiderable in the ſeed of a certain wormwood than in any other bitter:

bitter: but of this I have ſaid enough above, when treating of the general qualities of bitters.

ABROTANUM.

THIS, as a ſpecies of the ſame genus Artemiſia Linnæi, has certainly the ſame virtues as the other ſpecies of it. It contains, however, leſs of the bitter, but more of the aromatic; and if it deſerves, as Profeſſor MURRAY thinks, to be more employed than it has been, it muſt be on account of its aromatic and volatile parts; of which, however, the peculiar virtues are not yet well aſcertained. Theſe qualities, however, give a probable reaſon for its being frequently employed, as it commonly is, in fomentations.

THERE were formerly two herbs under the title of Abrotanum in our diſpenſatory liſts, under the improper diſtinction of *Mas et Fœmina*, but the latter of a different genus, and in every reſpect of inferior virtue, which is now omitted in the Britiſh diſpenſatories, and indeed in moſt others.

SCORDIUM.

THIS plant has a bitter joined with ſome volatile parts; but neither of theſe qualities are conſiderable enough to retain it in the preſent practice. It was formerly much celebrated as an alexipharmic; but we do not allow this to be a term of any clear and determined meaning: and in moſt inſtances think it has been an imaginary power, that is not ſupported by any clear or well aſcertained experience.

THERE are two other ſpecies of the teucrium, the *Chamædrys* and *Chamæpitys*, which have formerly had a place in our diſpenſatory liſts; but they are now omitted in that of Edinburgh: and though they ſtill hold a place in that of London and many other diſpenſatories, I do not expect to ſee them brought again into practice, as their qualities, whether as bitter or aromatic, are by no means conſiderable. They have been celebrated for antarthritic virtues, and make a part of the Portland powder; but they are manifeſtly not the moſt powerful or valuable part of that compoſition. When employed by themſelves, as they have ſometimes been, I would make the ſame remarks with reſpect to them as I have made with reſpect to the Portland powder, or other medicines that have been propoſed for the cure of the gout.

ARISTOLOCHIA.

WHICH of the ſpecies of this genus are to be preferred I cannot determine; and believe the difference between the rotunda, longa, and tenuis, is not conſiderable, though the latter ſeems now to be preferred by both the colleges of London and Edinburgh. They are all of them conſiderably bitter, with more acrimony than in any other of the bitters commonly employed. Its name ſeems to have ariſen from the ſuppoſition of its emmenagogue virtues, and in ſome caſes of retention and chloroſis, as a warm and ſtimulating medicine, I have found it uſeful; but in caſes of ſuppreſſion I never found it of any uſe: and the commendation of it by the ancients in promoting the lochia, facilitating birth, and promoting the excluſion of the ſecundines, is very ill founded, and affords a remarkable example of their imperfect knowledge; and an example which, if followed, would lead to a miſchievous practice.

THE ariſtolochia has been long commended as a cure for the gout. It makes a conſiderable part of the Portland powder, and has often been employed by itſelf in the ſame manner as that powder, to be taken every day for a great length of time. It has the ſame power of preventing fits of the gout, and commonly with the ſame conſequences; of which many inſtances are recorded by the phyſicians of Germany. To this purpoſe I would make only one quotation from the late learned and experienced WERLHOFF, firſt phyſician to his late Majeſty for the Electorate of Hanover. The quotation is taken from his Cautiones Medicæ, page 346 of his works publiſhed by WICHMAN. After ſpeaking of the power of diet in the cure of the gout, he has the following words:

> “ Si diæta minus ſufficiat, in declinatione, ſed lenta longaque nimis, ad maturandam firmandamque integritatem, et ad præcavendam reverſionem nimis ſubitam, veterum illæ antidoti amaræ tonicæ, apud Sennertum, Schneiderum *de Catarrhis*, WALTHERUM in Sylva Medica, collectæ, quas inter præcipue ariſtolochiæ ſpecies, rotunda, cava, longa, et clematitis, memorari merentur, experientiam moderatarum laudum teſtem reperiunt. BRUNNER de pancr. ſecund. p. 143, eleganter, ut ſolet, et diſtincte, ‘ tincturæ, inquit, illius antipodagricæ ex rad. ariſtol. longæ, aut pilularum, aut pulverum amaricantium uſu per annum continuato, paroxyſmi podagrici in nonnullis mitigantur, in aliis penitus extinguuntur. Nimirum longo amaricantium uſu, acore ſtomachi emendato, refracto, et attemperato, fructus exinde propullulantes ſponte cadunt ſua. Sed et nimio amaricantium horum uſu fermentum ſtomachi adeo debilitatem eſſe memini, ut nonnulli appetitum amiſerint, cibos non concoxerint, mortem hinc potius, quam ſanitatem, accelerarint, malique et infauſti remedii, ſævas dederint pœnas.’ Nempe ſpiritus vini, ſulfure amaricante ſaturatus, qui opio haud valde abſimilis eſt (de cujus abuſu pariter noxio, v. idem BRUNNERUS ibidem, p. 80. ſeq). et inflammans inſuper, et impenſe exſiccans, haud ſatis tutus ita continuato uſu videtur. Neque ideo illam ex vini ſpiritu potulentam tincturam ſive infuſionem, uſurpare pro eo ſcopo auſim, quum, licet corrigat, et adverſus paroxyſmos roboret

“ ipſum remedium amarum, ignea viciſſim et elaſtica ſpiritus vi-
“ ni indoles materiei augendæ, perturbandæ, et viſceribus incen-
“ dendis apta eſt, ceteroqui etiam vino ipſo magis incongruens.
“ V. quæ de noxa infuſionis ejuſmodi ex ariſtolochia longa ha-
“ bent Ephem. Curios. noviſſ. A. 3. p. 62. ſeq. Ipſa vero pul-
“ verum amarorum cumulata aſſumptio, quamvis moderati-
“ ori, pro ευφορια et indicatione, uſu tuta, ſtomachum tandem abu-
“ ſu gravat, tonumque et digeſtionem arte nimis diu roborare
“ affectando, naturam tandem ſuum rite agere vel prohibet, vel
“ deſueſcere facit, vel etiam, incenſo ultra digeſtionis vim ap-
“ petitu, diætæ erroribus accitis, in coctionis negotio fatiſcere
“ patitur. Atque haud ſcio an, perpetuo et nutricio quaſi ama-
“ ræ medicinæ uſu, quæ in alimentum corpori nata haud vide-
“ tur, alienior tandem ipſis ſuccis noſtris craſis imprimi poſſit:
“ licet id non fiat, ſi medice utaris, et obtento ſcopo omittas.”

ALTHOUGH it may not be eaſy either to explain or vindicate all the reaſonings in this long quotation, yet it would have been improper to abridge it, or to refer merely to Werlhoff's works, which I could not ſuppoſe to be in the hands of many of my readers; and I am at the ſame time perſuaded, that any perſon who has the leaſt diſpoſition to enter into the queſtion concerning the uſe of bitters in the gout, will find in the above quotation ſome illuſtration and confirmation of what I had before delivered on the ſubject.

SERPENTARIA VIRGINIANA.

THIS as a ſpecies of ariſtolochia is placed here, and it has very much of the qualities of the genus; but by certain accidents, this and the other ſpecies of ariſtolochia have been conſidered as very different. The ſerpentaria, both in taſte and flavour, is more agreeable than the other ſpecies, and it is by its ſenſible qualities of bitterneſs and aromatic acrimony that we can account for the virtues juſtly aſcribed to it.

BOTH theſe qualities render it antiſeptic, and powerfully tonic; and therefore ſuited to prevent gangrene. The ſame qualities will account for its cure of intermittent fevers, eſpecially when combined with Peruvian bark and aſtringents.

BY its aromatic acrimony it proves a powerful ſtimulant to the ſyſtem; and therefore may be uſeful alſo in ſome caſes of continued fevers: but as the cure of either intermittent or continued fevers by ſtimulants alone is an ambiguous and dangerous practice, ſo in the former it is only ſafe when joined with the bark; and the uſe of it in continued fevers is to be employed with much caution. The common opinion of its alexipharmic powers, both with reſpect to it and all the others which have gone under the ſame title, is an incorrect and falſe notion liable to much abuſe, and which I myſelf have had occaſion to obſerve. The ſtimulant power of the ſerpentaria is eſpecially ſuited to the low and advanced ſtate of the typhus only; and even then it will be more ſafely joined with the bark than employed for its ſtimulant power alone. It is certainly owing to this ambiguity in its uſe, that it is not nearly ſo much employed in practice as it was ſome forty years ago.

CORTEX AURANTII.

THIS by an overſight was omitted in our catalogue, but muſt be taken notice of here.

AURANTIUM or *Orange*. It is a ſpecies of the citrus; and that with the lemon, being the ſpecies chiefly imported, is that which is employed by us in medicine. The fruit affords an agreeable acid to be mentioned hereafter; but our buſineſs here is only with the yellow rind of the fruit. It is properly reckoned among the bitters, and ſeems to have the virtues in common to theſe; but with its bitter it contains a conſiderable portion of a volatile aromatic oil, very different from any other that is combined with other bitter, except what is found in the lemon. The combination of this oil with the bitter in the orange-peel, gives it certainly peculiar virtues that are not, however, clearly aſcertained; and it is rarely that this peel is with us employed except in compoſitions with the other bitters, which prevents us from diſcerning its peculiar virtues.

FORMERLY the unripe fruit, before they came to contain any juice, were employed in the ſhops under the title of Aurantia Curaſſaventia; and in that ſtate they contain a ſtronger bitter than the peel of the grown fruit, though to me they do not ſhow ſo much of the aromatic as the latter. I doubt much if the Edinburgh college have not done improperly in omitting the Curaſo apples which formerly ſtood in their liſt.

WITH reſpect to the virtues of the peel as preſently employed, it is very probable that both by its bitter and aromatic parts it may be particularly uſeful in reſtoring the tone of the ſtomach when it has been much impaired; and I have had ſeveral obſervations that juſtify this opinion: but it does not appear ſo often as it ſhould, becauſe we employ it almoſt only in its dried ſtate, and in too ſmall proportion, as we take it dried with a part of the white inert ſubſtance that is alſo in the rind of the orange.

ALTHOUGH I have no particular experience of it, it is probable enough that the orange-peel employed by itſelf may be uſeful in curing intermittent fevers. It is not, however, ſo probable to me that it has ever been uſeful in moderating or reſtraining uterine hemorrhagies; and upon the authority of others I have employed it, but without ſucceſs: and as the decoction made according to the preſcription by Dr WHYTE had ſtill much bitterneſs, I judge it to have been rather hurtful.

HERE I might mention the lemon-peel as a bitter; but it has leſs of that quality than that of the orange; and therefore if it be employed as it is in the infuſum gentianæ compoſitum of the London college, I take it to be on account of its aromatic rather than its bitter qualities.

AMONG the bitters I am diſpoſed to mention the leaves of the orange tree, which have of late been much recommended as a cure of epilepſy.

OF theſe, however, I have had little opportunity of making trials; and the few I have made were without ſucceſs. The ſenſible qualities of thoſe leaves are bitter and aromatic; but in both reſpects weaker than in the orange-peel; and there is nothing in them that would lead me to expect any ſpecific virtue.

ARNICA.

As this plant is not a native of Britain, and we have found ſome difficulty in procuring it from abroad, I have not been able to make it a ſubject of my own obſervation. In this ſituation I think it ſafer to refer my readers to writers on the ſubject, and particularly to COLLIN's diſſertation upon it, than to give from them a compilation which muſt be ſhort, and might be imperfect.

CASCARILLA.

I HAVE been uncertain where to place this ſubſtance, whether here with the aromatics or with the tonics; and I am of opinion that the latter is its proper place. It approaches to the aromatics by its eſſential oil; but its bitter, to be extracted by either water or ſpirit, is its moſt conſiderable part.

IT was introduced into practice in the laſt century as a medicine of great value, both in continued and in intermittent fevers; and the STAHLIANS, fond of any thing as a ſubſtitute for the Peruvian bark, againſt which they had declared ſo ſtrongly, received the caſcarilla, and employed it much in practice, and have given many teſtimonies of its efficacy; but theſe teſtimonies have not been ſupported by other practitioners ſince; and particularly in this country we have found it a very weak ſubſtitute for the Peruvian bark. BERGIUS ſays of it, "Aſt fatendum illum in ipſis febribus parum facere, neque tertianis vernalibus certo mederi." Our experience in this country is ſuitable to this; and in ſeveral trials it has entirely failed. What BERGIUS adds to the paſſage quoted, "Sed in hemoptyſi ſæpe prodeſt," is not ſupported by our experience; and in hemorrhagies of all kinds, it ſeems to be rather hurtful, as might be expected from its aromatic and bitter qualities, while it does not in any inſtance diſcover an aſtringent power. It may be allowed to be of tonic and ſtomachic power; but even in this way its virtues are not peculiar nor conſiderable: and there is no juſt foundation for the prejudices which the German phyſicians have conceived in its favour.

CORTEX PERUVIANUS.

THIS is one of the moſt conſiderable articles of the materia medica; and as the moſt frequently employed, ſo it has been very frequently the ſubject of writings and of much diſcuſſion. There is ſome general agreement amongſt practitioners with reſpect to many of its virtues; but the agreement is not univerſal,

ſal, and many diſputes ſtill ſubſiſt with reſpect to the circumſtances and manner in which it is to be adminiſtered.

UPON many of theſe points it is incumbent on me here to offer my opinion; which I ſhall accordingly do upon the principles I have already laid down, and as it appears to me to be confirmed by an attentive and often repeated experience. I have an averſion to controverſy, and ſhall not therefore enter into any; more eſpecially with many of the frivolous writers who are to be met with upon this ſubject.

As the foundation of the whole of my doctrine, I conſider the Peruvian bark, which, like other writers, I ſhall commonly ſpeak of under the ſimple title of the Bark, to be a ſubſtance in which the qualities of bitter and aſtringent are conjoined. Theſe are ſufficiently obvious, and ſeem to be univerſally allowed. It may alſo have ſomewhat of an aromatic quality; but this certainly is not conſiderable, and I ſhall not take any further notice of it.

As a bitter and aſtringent conjoined, I conſider the bark as a powerful tonic. As we have before ſhown that theſe qualities in their ſeparate ſtate give tonic medicines, ſo it will be readily allowed, that, conjoined together, they may give one ſtill more powerful; and as ſuch we are now to conſider the bark in its effects and virtues, according as theſe appear in the various caſes of diſeaſe.

THE firſt to be taken notice of is, its operation on the ſtomach. In many caſes dyſpeptic ſymptoms manifeſtly ariſe from a loſs of tone in the muſcular fibres of the ſtomach; and in ſuch caſes as other bitters are, ſo the bark is a remedy, and one of the moſt powerful. No body doubts of its being a tonic with regard to the ſtomach; and it is equally well known that the ſtate of the ſtomach is readily communicated to the reſt of the ſyſtem. It is in no inſtance, however, more remarkable than in the cure of intermittent fevers. That the bark in this caſe operates by a tonic power exerted in the ſtomach, I have endeavoured to explain in my *Firſt Lines of the Practice of Phyſic*; and have met with nothing in any writing to make me doubt of the truth of my doctrine. It may, indeed, have its imperfections, and may not ſufficiently explain the whole of that variety of phenomena which may occur in ſuch a diverſified and complicated ſyſtem as that of the human body; but in attempting any general doctrine, we muſt begin with attempting it as adapted to the moſt general and ordinary courſe of things. This I hope is done in my doctrine reſpecting fevers, and of the operation of the bark in the cure of intermittents: nor ſhall I think it ſhaken by its not obviouſly explaining thoſe irregularities that may happen in the courſe of fevers, and in the uſe of the bark; and eſpecially thoſe pointed out by the indigeſted views of ſome practitioners, little aware of the many fallacies to which almoſt every obſervation upon theſe ſubjects is expoſed.

WE proceed therefore upon the ſuppoſition that the bark poſſeſſes a tonic power, and that the action of this power in the ſtomach ſufficiently explains its operation in preventing the recurrence of the paroxyſms of intermittent fevers: for I ſee no foundation for referring it to any myſterious and unexplained ſpecific power; which, however, ſome writers ſeem ſtill diſpoſed to maintain. I hold it to be eſtabliſhed as a fact, that both aſtringents and bitters, in their ſimple and ſeparate ſtate, have proved often ſufficient to prevent the recurrence of the paroxyſms of intermittent fevers; and that they more certainly do it when combined

bined together. Both theſe facts I have not only from the teſtimony of the moſt creditable authors, but from particular experiments made by myſelf for the purpoſe of aſcertaining them: And though I ſhould admit what is frequently alleged on this ſubject, that ſuch remedies are frequently inſufficient, I conſider it as a frivolous argument, as a different degree of power does not affect the general queſtion concerning the nature of that power. No body certainly will maintain, that pale bark is not capable of curing agues, becauſe it is not ſo powerful as red bark.

HAVING thus eſtabliſhed the nature and operation of this medicine, we proceed to conſider the various queſtions that have ariſen with reſpect to the uſe of it in intermittent fevers. It would now be ſuperfluous to conſider the objections which were formerly made to its uſe in general. Although theſe objections had for a long time ſome weight with ſome of the moſt eminent practitioners, it is preſumed that every doubt and difficulty of that kind is now removed; and whilſt it is allowed to be a very ſafe and very powerful remedy, the only queſtions which remain reſpecting it are, In what circumſtances it may be moſt properly employed?

THE firſt queſtion that occurs is, At what time, in the courſe of the diſeaſe, it may be moſt ſafely given? Dr BOERHAAVE's rule for exhibiting the bark was, "Cum morbus jam aliquo tempore duravit;" and his commentator is at great pains to inculcate the propriety of this general rule. In this, indeed, both of them follow Dr SYDENHAM; but both SYDENHAM and VAN SWIETEN allow there may be exceptions to the general rule: as when an intermittent affects perſons under great debility, or when, for example, the paroxyſms are attended with ſymptoms of a dangerous kind: and in ſuch caſes every practitioner will certainly take the firſt opportunity he can find of exhibiting the bark.

THIS, however, does not touch the general queſtion with reſpect to intermittents in which there is no prevailing debility, and where the paroxyſms are not attended with any dangerous or even unuſual ſymptoms. In ſuch caſes the queſtion ſtill remains, Whether the bark may be exhibited without waiting for any repetition of paroxyſms? And I am perſuaded that, for the moſt part, it may. Dr SYDENHAM's conſideration of the fermentationis niſu deſpumanti, ſeems to be abſolutely without foundation: and I cannot either perceive that there is any morbid matter to be evacuated during the paroxyſms, or that the bark can do any harm by ſuppreſſing any natural excretions, as the Stahlians have commonly ſuppoſed. It therefore appears to me, that the bark may be exhibited very early in the courſe of the diſeaſe.

THIS general queſtion, however, always involves another; which is, Whether the bark may be exhibited without a certain preparation of the body, that may fit it to receive the bark with greater ſafety? With reſpect to this, as we confidently ſuppoſe that the bark given in moderate quantity is not ready to diſturb the natural functions of the animal œconomy; ſo, if theſe be all in a ſound condition, we cannot perceive that any preparation of the body is neceſſary for the reception of this medicine: It ſhall only be obſerved, that to render the ſtomach more fit to receive the quantity of bark which may be neceſſary, it may be proper, by a gentle vomit, to free it from accidental indigeſtion, and to excite its activity before the bark is thrown in.

IN another caſe alſo, when, from the circumſtances of the ſeaſon, and from certain appearances, there is reaſon to ſuſpect any redundancy of bile, it may be proper to evacuate this by a gentle purgative. This is the explanation to be given of the common opinion of the neceſſity of clearing the firſt paſſages before exhibiting the bark; but I muſt beg leave to maintain, that ſuch preparation is not always neceſſary; and that wherever the ſtate of the diſeaſe urges an immediate exhibition of the bark, it may be often dangerous to loſe time upon the ſuppoſed neceſſity of previouſly clearing the firſt paſſages; or at leaſt, when this is done, it will always be allowable, and even proper, without waiting for the repetition of paroxyſms, to put an end to the courſe of the diſeaſe by the uſe of the bark.

ALTHOUGH, when there is no debility in the patient, nor dangerous ſymptoms attending the paroxyſms, the exhibition of the bark, in complaiſance to popular opinion or medical prejudice, may be ſometimes delayed; yet if the paroxyſms ſeem to be anticipating their periods, and more eſpecially if they are increaſing in their duration, it will be always adviſable to ſtop the courſe of them by an immediate exhibition of the bark.

THERE may ſtill, however, be ſome exceptions to this general doctrine; not only when there are marks of internal inflammation preſent, but even when there are marks of a general inflammatory diatheſis in the ſyſtem. This I believe to be always aggravated by the tonic power of the bark; and in ſuch caſes, accordingly, the bark may not only be hurtful, but, as I know from experience, will be ineffectual; till, by blood-letting and other antiphlogiſtic meaſures, the inflammatory diatheſis is removed or much abated. This is the explanation of the 762d Aph. of BOERHAAVE: "Hinc et venæſectio nocet per ſe ſemper "prodeſt alias caſu, ut et tenuis exactaque diæta." It is eſpecially in the caſe of vernal intermittents that a phlogiſtic diatheſis occurs; and therefore, that upon this and other conſiderations, the exhibition of the bark in theſe may be moſt ſafely delayed; but ſtill it muſt be allowed that, even in theſe, it may often be exhibited very early.

THERE is another conſideration which practical writers have mentioned as a reaſon for avoiding the exhibition of the bark; and that is, when there are marks *obſtructi admodum hujus illiuſve viſceris.*

THAT there may not be caſes of this kind to forbid the exhibition of the bark, I have not ſufficient experience to determine; but I am well perſuaded that it would be very dangerous to admit of any general rule on this ſubject. I am convinced that it is in the cold ſtage of fevers that accumulations of blood are formed in the liver and ſpleen; that ſuch accumulations are increaſed by every repetition of a cold ſtage, and conſequently by the repetition of paroxyſms; and I am therefore clearly of opinion, that even conſiderable obſtructions of the viſcera, if without inflammation, ought not to prevent the exhibition of the bark in ſuch quantity as may prevent the return of paroxyſms.

I AM more fully of this opinion, becauſe I cannot perceive in what manner the bark can aggravate the obſtruction. Its action as an aſtringent is very inconſiderable, and is fully balanced by its bitterneſs, which moſt phyſicians ſuppoſe to have a reſolvent and aperient power. The queſtion has ſeveral times occurred to me, in the caſe of perſons who, having frequently laboured under intermittents, had tumours and indurations remaining in the hypochondria, and had, when in that condition, a return of the intermittent fever. In ſuch caſes I have freely employed the bark, and never found it increaſe the affection of the liver or ſpleen: and in other ſuch caſes I have conſtantly found, that the avoiding the bark, and admitting therefore the repetition of paroxyſms, brought on diſorders which frequently proved fatal.

WHEN, from theſe conſiderations, it is determined to exhibit the bark, the next queſtion that occurs is, Taking the period as conſiſting of the intermiſſion and paroxyſm, at what time of ſuch period the bark is moſt properly to be given? With reſpect to this, I believe, that when the uſe of the bark was firſt introduced, the practice was to give a large doſe of it a little before the time of an expected acceſſion; and the efficacy of this practice has given occaſion to many to imagine, that the bark employed by theſe firſt practitioners was of a ſuperior quality to that commonly employed ſince. We cannot, however, find otherwiſe any proof of this ſuperiority of the bark then employed; and it is certain that the ſame pale bark which has been commonly ſince employed, and given in the ſame quantity, and at the ſame time of the period, has ſhown very often the ſame effects. Some eminent practitioners have ſince oppoſed this practice; but we are perſuaded it has been rather from theory than from obſervation that they have done ſo.

ALTHOUGH I would not rigorouſly inſiſt on the employment of a ſingle doſe near to the time of acceſſion, yet I am ſtrongly of opinion, that the nearer the exhibition is brought to that time, it will be the more certainly effectual. To explain this, not commonly underſtood, we muſt remark, that the effects of the bark on the human body are not very durable. I have had opportunities of obſerving, that a conſiderable quantity of bark given, was not ſufficient to prevent a relapſe in a few days after. I have likewiſe found, that, in quartan fevers, a large quantity of bark given on the firſt day of intermiſſion was not ſo effectual in preventing the returns of the diſeaſe, as a ſmaller quantity given on the ſecond day. In tertians, ſuppoſing a certain quantity neceſſary to be given to prevent the return of a paroxyſm, we have found that, by following the practice of SYDENHAM, in abſtaining from the exhibition of the bark for ſome hours immediately preceding acceſſion, though large quantities had been given before, would often fail in preventing it; while, on the other hand, a ſmaller quantity, given nearer to that time, would more certainly anſwer the purpoſe. In many caſes, where the acceſſion happened in the morning, I have found that a large quantity given the day before, if not continued during the night, would often fail, when a ſmaller quantity given during the night, and in the morning, would more certainly ſucceed; and whenever I met with tertians which had their acceſſions at noon or after it, I have thought it unneceſſary to trouble my patients during the time of intermiſſion on the day before, always finding that a ſmaller quantity given in the morning or forenoon after, by being thus brought nearer to the time of acceſſion, was more effectual.

FROM all theſe obſervations I am ſatisfied, that the giving a large doſe of the bark immediately before the time of acceſſion is the moſt proper practice: but as that doſe muſt not be under two drams of pale bark, ſo there are ſome ſtomachs which will not bear even that quantity, or a larger that might be neceſſary. It is commonly, therefore, convenient to give ſmaller doſes, but to give them every hour for ſome hours near to the times of acceſſion.

I HAVE not had much occaſion to practiſe upon intermittent fevers ſince the uſe of the red bark became common; but being well perſuaded of the ſuperior powers of this ſpecies or variety of bark, I think the uſe of it will particularly favour the practice we have recommended, of giving a due quantity of bark as near as poſſible to the times of acceſſion.

HAVING thus ſaid all that ſeems neceſſary with reſpect to the uſe of the bark in *intermittent*, we proceed to ſay that it is equally uſeful and neceſſary in *remittent fevers*. Theſe have been conſidered by the Noſogoliſts as of a different order from the intermittents; but, as I judge, very improperly. They ariſe from the ſame cauſe; that is, from marſh effluvia; they prevail at the ſame ſeaſons; and it is common for the intermittent and remittent fevers to paſs mutually into the form of one another. They ſhow therefore the ſtricteſt affinity, and found a ſtrong preſumption, ſufficiently confirmed by experience, that they may be cured by the ſame remedy.

THE only difficulty in admitting this was, the opinion which prevailed very early with reſpect to the uſe of the bark; that it was not to be given during the time of paroxyſms, and therefore not in thoſe fevers which had no intermiſſion. I believe that this opinion was in the main well founded and proper, with reſpect to the paroxyſms of genuine intermittents; but no other remedy having been found for remittents, the conſideration of the analogy induced practitioners to employ the bark in theſe alſo. And in ſpite of prejudices, MORTON and TORTI eſtabliſhed the practice; and there is now no longer any doubt of its propriety. We have only to add, that though I would not rigidly aſſert that the bark can never be ſafely given during the exacerbation or hot ſtage of fevers, yet I maintain, with the moſt part of practitioners, that the time of remiſſion is eſpecially to be choſen; and according as that time is known to be longer or ſhorter, the doſes of the bark are to be as large as the patient's ſtomach will eaſily bear, ſo that a due quantity may be thrown in during the time of remiſſion.

SUCH may be the uſe of the bark in properly and evidently remittent fevers; but the uſe of it has been extended alſo, eſpecially of late, to continued fevers: and there may ſtill be a queſtion, In what ſpecies, or in what circumſtances of theſe, it may be properly employed? Which we ſhall endeavour to anſwer as well as we are able.

WHEN intermittent fevers have changed into remittents, and theſe have become of a very continued form, or when either this tranſition has been manifeſtly perceived, or that, from the place of the patient's habitation, from the ſeaſon of the year, and from the nature of the prevailing epidemic, there is reaſon to conclude that a fever has ariſen from the ſame marſh effluvia which produce intermittent or remittent fevers in their ordinary form; in ſuch caſe, fevers, however continued in their form they may then ſeem to be, may ſtill be conſidered as of the intermittent kind, and be treated by the bark in the ſame manner that we have ſhown may be done in remittent fevers of little diſtinct remiſſion. There are, however, truly very few continued fevers of this kind which do not, being carefully obſerved, diſcover ſome remiſſions, and therefore give no proper occaſion to a queſtion about the uſe of the bark, ariſing from their continued form.

SUCH a queſtion, however, occurs with reſpect to continued fevers of another kind. There is a fever commonly occaſioned by the application of cold, but perhaps alſo from other cauſes, to which we have given the name of Synocha; and which, from its ſymptoms, we judge to be always attended with a conſiderable degree of phlogiſtic diatheſis. In ſuch fevers, agreeably to our opinion of the tonic power of the bark, we maintain that it cannot be properly or ſafely employed. And farther, as the ſame kind of fever attends all genuine phlegmaſiæ, that is, pyrexia joined with topical inflammation; ſo the bark is not admiſſible in any of thoſe. Some writers, indeed, mention its ſalutary effects in various caſes of pneumonic inflammation, and ſuch perhaps may occur; but I never found the bark ſafe in any ſuch inflammatory affection, except when this was not the primary diſeaſe, and indeed only when it was accidentally combined with an intermittent, putrid, or nervous fever.

THAT there may be ſuch combinations is well known; and though there may be ſome degree of phlogiſtic diatheſis preſent, it may not be in ſuch a degree as to give the principal indications in the cure of the diſeaſe: ſo, in ſuch caſes, the bark may be employed as ſuited to that principal indication.

IN one caſe of an inflammatory diſeaſe, the bark has been conſidered as an ambiguous remedy; and that is the caſe of acute rheumatiſm. As I conſider this diſeaſe as eſpecially conſiſting in a phlogiſtic diatheſis, I hold the bark to be abſolutely improper, and have found it manifeſtly hurtful, eſpecially in its beginning, and in its truly inflammatory ſtate.

BUT it is poſſible, that after rheumatiſm has continued for ſome time, and eſpecially after the uſe of antiphlogiſtic remedies and ſweating, the inflammatory ſtate may be abated, and the diſeaſe, in conſequence, admit of conſiderable remiſſions, and become a periodical diſeaſe. The bark, in ſuch caſes, may prove a proper remedy, and I have ſometimes found it to be ſo; but it requires ſome caution: for in ſome inſtances, where even a remiſſion was evident, and appeared particularly by a copious ſediment in the morning's urine, I have exhibited the bark with a bad effect, as the exacerbations became more violent, and the remiſſions leſs conſiderable, inſomuch that I was obliged to have again recourſe to antiphlogiſtic remedies and ſweating.

IN another caſe of acute rheumatiſm, the bark may prove a remedy; and that is when the rheumatiſm is combined with, and makes a part of, an intermittent fever, as that and other phlegmaſiæ may ſometimes be: and here the conduct may be the ſame as I have already ſaid to be proper in ſuch caſes.

I KNOW of no other caſes of acute rheumatiſm in which the bark may be employed; but there are certain circumſtances of the human body, in which pains of the joints reſembling rheumatiſm may occur, and in which perhaps the bark may be uſeful. So far, however, as I know ſuch caſes, they are without any phlogiſtic diatheſis, and therefore not properly acute rheumatiſm. I have met with ſome caſes of hyſteric women troubled with pains and tumours of the joints, ſo much reſembling rheumatiſm, that I have thought it neceſſary to try blood-letting; but though the blood was drawn in the manner moſt proper to ſhow an inflammatory cruſt, yet no ſuch cruſt in any degree appeared, and therefore ſuch caſes do not exclude the uſe of the bark.

THE queſtion concerning the uſe of the bark in inflammatory fevers does not give much difficulty; but there is another kind of continued fever, in which the queſtion is much more puzzling. This is the fever ariſing from a contagion produced by a certain ſtate of human effluvia. It is this that I have named a Typhus; and which always puts on a very continued form. It is very commonly attended with ſymptoms of putreſcency in the fluids; and always, in ſome part of its courſe, with ſymptoms of a general debility in the ſyſtem. In the former caſe they are called Putrid, and in the latter caſe Nervous Fevers.

IT is in theſe that a difficult queſtion ariſes with reſpect to the uſe of the bark; and this, conſidered as an antiſeptic and tonic, would ſeem to be well adapted to both caſes. But in conſidering the queſtion, this is to be obſerved, that both the putrid and nervous fevers may be combined, eſpecially in their commencement, with a phlogiſtic diatheſis in the ſyſtem. With this ſtate, as I have ſaid already, I hold the bark to be incompatible; and therefore judge it to be always improper in the beginning of that kind of fever which, in my Noſology, I have named a Synochus. I can by no means concur with certain authors who maintain, that in the fevers we are ſpeaking of, as ſoon as the primæ viæ have been cleared by an emetic and purgative medicine, we may immediately employ the bark, and truſt the cure of the diſeaſe entirely to it. I have frequently obſerved the miſchievous conſequences of ſuch a practice, from its aggravating the inflammatory ſtate of the ſyſtem, and determining to local and fatal inflammations of the brain and lungs.

It is perhaps poſſible, that a typhus of the nervous or putrid kind may be without any, or much of the inflammatory diatheſis; and when at the ſame time the ſymptoms of debility and putreſcency are not only conſiderable, but alſo appear early, I would allow that the bark may be employed very ſoon in the courſe of the diſeaſe. This, however, I take to be a very rare caſe; and my obſervations lead me to judge, that in the beginning of all putrid fevers, and by the teſtimony of authors, even in the plague itſelf, that more or leſs of an inflammatory diatheſis ſometimes takes place. We find this to ſubſiſt commonly for the firſt week of our epidemic fevers; and therefore, that it is ſeldom ſafe to employ the bark during that period. We commonly find that the ſymptoms requiring its uſe do not appear till the ſecond week; and even then, till the ſymptoms of debility and putreſcency appear pretty diſtinctly, the bark cannot be ſafely employed. When, however, very early, the ſymptoms of putreſcency appear in any degree, it will always be allowable to employ the bark; and, though no clear ſymptoms of putreſcency appear, it will be equally proper in the ſecond week of nervous fevers, when the ſymptoms of debility are anywiſe conſiderable, and when at the ſame time the ſyſtem is very free from any appearances of an inflammatory ſtate. To ſum up the matter, we are clearly of opinion, that when fevers can be aſcertained to be entirely of the putrid or nervous kind, wine and bark are the remedies to be depended on; and that, if either of theſe remedies have ſeemed to fail, it has been commonly owing to the neceſſary quantities not having been thrown in.

WE muſt not omit this opportunity of obſerving, that there are two caſes of our epidemic fevers in which the bark is either uſeleſs or hurtful. The firſt is when, after much headach, a delirium ariſes; which is ſomewhat of the phrenetic kind, increaſed by taking wine, and is attended with a redneſs and inflammatory ſtate of the eyes. In ſuch caſes, we ſuſpect ſome inflammation of the brain; and diſſections have ſhown it to be ſo: and in all ſuch I have found the bark manifeſtly hurtful. Another caſe of our fevers is, when in their advanced ſtate, with much delirium, there is much ſubſultus tendinum, with frequent convulſive twitchings of the limbs. In whatever manner this may be explained, I have found that opium is the proper remedy; and it is commonly neceſſary to give it in conſiderable quantity.

AFTER treating of the uſe of the bark in the more ſimple fevers, we are now to conſider it in the more complicated, and particularly in the exanthematic kind.

WITH reſpect to theſe, they are commonly, and, as we may ſay, naturally, of an inflammatory nature; but in a manner we cannot explain; a putrid diatheſis frequently appears in them. In their genuine inflammatory condition, the bark is not only an unneceſſary, but a hurtful ſubſtance; but when any putrid diatheſis appears, it is abſolutely required, and the diſtinction of theſe caſes is always to be carefully ſtudied.

IN the ſmall-pox, from an opinion of the bark being favourable to ſuppuration, it has been employed even during the eruptive fever; but I have hardly ever obſerved a caſe in which it ſeemed to be proper. Allowing the bark, in certain circumſtances, to be favourable to ſuppuration, it does not appear clearly that theſe circumſtances ever occur during the eruptive fever. It is poſſible that the eruptive fever of the ſmall-pox may be of the putrid kind, in which therefore the bark might be allowable; but have hardly ever been able to aſcertain ſuch a caſe: and upon the ſuppoſition of its being the caſe, I have found the exhibition of the bark to be hurtful. In my opinion, it is only after the eruption, that, by the confluence of the puſtules and other circumſtances, we can diſcern the putrid diatheſis which requires the bark; and when none of theſe circumſtances are preſent, as in moſt caſes of a diſtinct ſmall-pox, though theſe be very numerous, the bark in large quantity is very hurtful.

IN the ſecondary fever, the ſame diſtinction is to be obſerved; and as it is moſt commonly the conſequence of the confluent ſmall-pox, ſo it is very generally of a putrid kind, admitting of the bark: but there is alſo a ſecondary fever ſometimes happens after a diſtinct ſmall-pox, which is of the inflammatory kind, to be treated by blood-letting and other antiphlogiſtic meaſures; and in which, therefore, the bark would be hurtful.

THE meaſles are very conſtantly and conſiderably of an inflammatory nature; and muſt therefore require ſtill more caution in the uſe of the bark. I have never ſeen this diſeaſe in Scotland of the putrid kind; but no doubt there may be ſuch as DR WATSON has deſcribed, and in which the bark would certainly be proper.

WITH reſpect to Eryſipelas, the caſe is much the ſame. I have very conſtantly found it to be more or leſs of the phlegmonic kind; and in this country have hardly ſeen it in any degree putrid. In eryſipelas I have therefore found the bark generally hurtful: but from the account of authors, it appears to be ſometimes of a putrid nature; although, as I judge, eſpecially, perhaps only, when it accompanies other diſeaſes of a putrid kind; and in ſuch caſes the bark may be a neceſſary remedy.

IN the Scarlatina, there is generally more difficulty in determining this queſtion. In the ſpecies of ſcarlatina that is properly named Anginoſa, and which has been the moſt frequent with us, there are caſes exactly the ſame with the cynanche maligna, in which the bark is the remedy to be depended upon. But I maintain that there is a ſcarlatina, and even a ſcarlatina anginoſa, in which the bark is ſuperfluous, and has been often hurtful. How theſe caſes are always to be diſtinguiſhed is difficult to ſay; but an obſerving and ſkilful practitioner, by the difference of ſymptoms, and eſpecially by the nature of the prevailing epidemic, will commonly be able to do it.

We ſay nothing here of the miliary eruption, conſidering it to be always a ſymptomatic affection, to be treated with or without the bark, according to the nature of the primary fever.

AMONG other diſeaſes complicated with fever, the dyſentery is to be taken notice of as a diſeaſe in which the propriety of uſing the bark does not ſeem to be very clearly aſcertained. When this diſeaſe is of its proper nature; that is, depending chiefly upon a conſtriction of the colon, and frequently in its beginning attended with ſome phlogiſtic diatheſis, the uſe of the bark appears to me to be abſolutely pernicious. I have indeed ſaid above, that even in this ſtate, bitters, by their laxative quality, may frequently be uſeful: but ſuch a quality in the bark is very uncertain; and therefore the analogy with bitters will hardly imply the uſe of a bitter that may be in this way of uncertain effect, and may be in danger, by its tonic and inflammatory powers, of proving hurtful. In the beginning of dyſentery, we judge the bark to be improper; but in the advanced ſtate, when ſome ſymptoms of putreſcency appear, or when the diſeaſe has changed in ſome meaſure into the ſtate of diarrhœa, the bark may poſſibly be employed with advantage.

IN another caſe of dyſentery, which ſometimes happens; that is, when it puts on a tertian type, and may be conſidered as a part of the tertian fever, at the ſame time epidemically prevailing, the bark may become an abſolutely neceſſary remedy.

THERE is another diſeaſe complicated with fever, in which I find the uſe of the bark to be ſomewhat nice and difficult; and that is in catarrhal affections. In theſe, ariſing, as they commonly do, from cold, an inflammatory diatheſis is, I believe, conſtantly preſent; and this ſeems to reject the uſe of the bark altogether. But there are two caſes in which it may be admitted; the one is, when the catarrhal affection is combined with an intermittent fever: and I have often obſerved the moſt frequent and violent fits of coughing to be joined with the paroxyſms, and particularly with the cold ſtage of ſuch paroxyſms. In ſuch caſes I not only do not avoid the bark, but fly to it with more haſte.

THERE is alſo another caſe of catarrhal affection in which the bark is of great ſervice. This is in thoſe habitual and frequently returning catarrhs, which depend upon a weak and imperfect perſpiration by the ſkin, and this again upon a weaker force in the action of the heart and arteries. In theſe caſes I ſuppoſe there is a greater determination to, and a greater than uſual accumulation of fluids, in the lungs; and that theſe circumſtances and their effects are only to be obviated by invigorating the ſyſtem of the aorta, for which I hold the bark and riding to be the moſt effectual means.

ANOTHER caſe of complicated fever on which I would here remark, is that of hæmorrhagy; in which the uſe of the bark is, in my opinion, very inaccurately aſcertained, but may, I think, be determined in this manner. When the hæmorrhagy is of the active kind, that is, accompanied with a phlogiſtic diatheſis, the bark is a pernicious medicine, and I have always found it to be ſo. Accordingly, as the hæmoptyſis appears to me to be very univerſally of the active kind, ſo I have conſtantly found the bark to be very hurtful in all the ſpecies of it that I have ever met with. There are, however, caſes of paſſive hæmorrhagy, a frequent inſtance of which occurs in the menorrhagia, where the diſeaſe depends upon a laxity of the extremities of the uterine veſſels, which are therefore readily opened by every irrita-

tion

tion applied to the ſyſtem, or to the diſeaſed part. In ſuch caſes, the bark is the moſt proper, and, when the remote and exciting cauſes can be avoided, an effectual remedy. Upon this ſubject two remarks may be made: One is, that though a hæmorrhagy may ſeem to be excited by irritation, it is not therefore to be immediately concluded to be of the active kind, and therefore forbidding the uſe of the bark. The other remark is, that the bark, in paſſive hæmorrhagy, does not act as an aſtringent, in which way its powers are very inconſiderable, but as a tonic, which might be hurtful in any hæmorrhagy of the active kind.

After mentioning cattarh and hæmoptyſis, I am, in ſome meaſure, neceſſarily led to ſay ſomething with reſpect to the uſe of the bark in the Phthiſis Pulmonalis. This diſeaſe is ſo conſtantly attended with a phlogiſtic diatheſis, that I am diſpoſed to reject the uſe of the bark in it altogether. There are, however, practitioners who are of a different opinion; but I can aſſert, that in nine caſes of ten in which I have ſeen it employed, it proved manifeſtly hurtful.

There are, however, circumſtances of the phthiſis we ſpake of, in which the bark has been uſeful. I have met with caſes in which, with all the ſymptoms of phthiſis, the exacerbations of the hectic were marked with more or leſs of a cold ſtage, and regularly, at ſtated periods, commonly quotidian, but ſometimes tertian. In ſuch caſes, I have given the bark with the effect of preventing the return of ſuch paroxyſms for ſome time, and at the ſame time with the relief of almoſt all the other ſymptoms of the diſeaſe. I never, however, in ſuch caſes, made a complete cure; for, in ſpite of large exhibitions of the bark, the paroxyſms, in leſs than a fortnight or three weeks after they had been ſtopped, always returned: and though they were again and again, by the ſame means, ſtopped, they returned with greater violence, and proved fatal, with all the ordinary ſymptoms of phthiſis.

As the Phthiſis Pulmonalis depends ſo often upon tubercles of a peculiar nature, which with no probability can be reſolved by the bark; ſo this is another reaſon for my avoiding the uſe of it in this diſeaſe. But whether there be caſes reſembling very exactly the phthiſis from tubercles, in which however there are none preſent, and therefore a more curable diſeaſe, and perhaps admitting the uſe of the bark, I cannot poſitively determine; but am diſpoſed to believe, that there are caſes, with all the ſymptoms of phthiſis pulmonalis, without tubercles, and depending upon a ſucceſſive formation, and healing again of ſmall vomicæ; in which caſe the bark may poſſibly be uſeful. In all the caſes of convaleſcence which happen after a purulent expectoration, I judge the diſeaſe to have been of this kind.

To finiſh my conſideration of the uſe of the bark in febrile diſeaſes, I muſt next mention the noted cure of gangrene which is frequently, though not always, connected with fever.

THE theory of this has been conſidered as very myſterious, but ſeems to me that it may be made very plain. In all the caſes in which I have obſerved the cure of gangrene by the bark, I have found that it was by exciting a degree of inflammation and ſuppuration around the gangrened part; and that, by this, the dead part was ſeparated from the living, and thus diſpoſed to be thrown off. This is ſometimes, and perhaps might be often, done by an effort of nature; but this is commonly prevented by the loſs of tone in the gangrenous ſpreading into the neighbouring parts. It is this, however, that is prevented, by the bark ſupporting and invigorating the tone of the neighbouring parts, and producing the inflammation we have mentioned.

THIS may ſerve to explain the different operation of bark in different caſes of gangrene. Whenever it ariſes from cauſes producing a loſs of tone, and thereby a gangrene in any part, the bark is likely to be effectual in ſtopping its progreſs; but where the gangrene ariſes from the acuteneſs and violence of inflammation in the part, there the bark is likely to be not only ineffectual but hurtful. The theory of Sir John Pringle may be found to be nearly the ſame, and might be expreſſed in the ſame language with that we have employed. In the 39th page of his Appendix, 4to edition, he has the following words: "Thus the bark will fail in a gangrene, if the veſſels are too "full, or the blood is too thick: But if the veſſels are relaxed, "and the blood reſolved or diſpoſed to putrefaction, either "from a bad habit, or from the abſorption of putrid matter, "then is the bark ſpecific." The whole of the obſervations I have had an opportunity of making in caſes of gangrene have fully confirmed this doctrine.

I have now concluded what relates to the uſe of the bark in febrile diſorders, and ſhall next take notice of its uſe in ſome chronic caſes: but after what I have ſaid above of tonics in general, and of bitters more particularly, it only remains to ſay here, that in the caſes to which tonics are adapted, the bark, as one of the moſt powerful, muſt be eſpecially proper.

THERE are two diſeaſes ſeemingly depending on the laxity of the ſyſtem; and therefore it has been ſuppoſed that the bark might be, and it is alleged that it had been, actually uſeful in

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the cure of them. Theſe are the diſeaſes of ſcrophula and rickets. I have no doubt that in both a conſiderable degree of laxity and flaccidity takes place in the ſyſtem; but I am very far from thinking that either of the diſeaſes conſiſt alone, or even chiefly, in this circumſtance; and if it was proper here, I could render it probable that theſe diſeaſes depend upon certain peculiar conditions of the ſyſtem, which do not ariſe from, and indeed rather induce a general laxity of, the whole: and I would particularly aſſert, that what has been ſaid with reſpect to the affinity between the two diſeaſes, appears to me to be an erroneous judgment. But whatever may be in this, I cannot conveniently enter into controverſy here; and do not think it neceſſary, as I muſt add that, in all the inſtances I have ſeen, and they are not a few, of the uſe of the bark in theſe diſeaſes, I have never ſeen clearly any benefit derived from it.

IT is much more probable that ſpaſmodic diſeaſes, depending upon a weakneſs of tone in the ſyſtem, ſhould be often cured by the uſe of the bark. Accordingly, it has been much employed in many of theſe, and particularly in caſes of epilepſy; but in this I have been often diſappointed. When epilepſy depends upon organic affections of the brain, I believe no remedy is to be found for it; or when this diſeaſe is connected with a plethoric ſtate, and is excited, as it frequently is, by an occaſional turgeſcence of the blood in the veſſels of the brain, I think neither the bark nor any other tonic can be properly or ſafely employed. It is only when epilepſy depends upon a mobility of the ſyſtem that we can expect the bark to prove a remedy; and in ſuch caſes it may poſſibly have often proved uſeful: but I have hardly found it to be ſo, and am of opinion, that the foſſil tonics, as chalybeates, cuprum ammoniacum, flowers of zinc, or white vitriol, are always found more effectual.

THERE is indeed one convulſive diſorder in which I have found the bark remarkably uſeful: and that is the chorea, which I believe to depend upon a ſtate of mobility at a certain period of life. In this diſeaſe, I think the preparations of copper and zinc cannot be employed with ſafety ſo often, or rather ſo long, as might be neceſſary; and therefore, that chalybeates and bark are the ſafer remedies: And we are of opinion that the latter is more ſafe than the former.

IN another convulſive diſorder, the chincough, we know the bark to be often an effectual remedy; but there is ſome difficulty in determining the proper time for its exhibition. Where the diſeaſe is yet recent, and the contagion perhaps ſtill acting, it is often hurtful; but when the diſeaſe is more advanced, and the force of the contagion is probably gone, and the diſeaſe continues by the force of habit only, I am pretty certain that the bark will then ſoon put an end to it, providing only that no congeſtion has been formed, or continues in the lungs.

WITH reſpect to aſthma, my doctrine muſt be the ſame as with reſpect to epilepſy. When the aſthmatic paroxyſm depends upon an occaſional turgeſcence of blood in the veſſels of the lungs, the bark is an improper, and may be a hurtful medicine; but when the aſthma depends upon the mobility of the ſyſtem, as in the hyſteric aſthma of Sir JOHN FLOYER, the bark is an uſeful remedy; and in ſome inſtances I have found it to be ſo.

THERE remain to be mentioned ſome ſpaſmodic affections, in which the bark has been much celebrated. Theſe are commonly named Hyſteric, and are of very various form. In theſe caſes in which ſuch paroxyſms as I have deſcribed in my Firſt Lines, under the title of Hyſteria, appear, I take this to be the genuine form that may be ſtrictly ſo named; and to be a diſeaſe of one determined kind, and occurring perhaps only, at leaſt eſpecially, in females of a ſanguine and ſomewhat plethoric temperament. But without proſecuting the hiſtory of the diſeaſe any farther, I muſt maintain what I have had confirmed by experience, that, in the form mentioned, the bark is not a remedy adapted to it.

THERE are, however, a great number of ailments which are frequently named hyſteric, or more commonly nervous diſeaſes, that are of very great diverſity; and, by their ſymptoms, not to be brought under any general character. If therefore we are to attempt any thing with regard to their general nature, it muſt be by preſuming to eſtabliſh a general cauſe. This I allow to be an uncertain plan; but I do not know at preſent how to do better.

IN attempting this, I would refer the nervous diſeaſes to one or rather two general cauſes: The one is, a weakneſs of tone, and thence a mobility of ſyſtem, in ſanguine temperaments, or in ſuch as are not manifeſtly melancholic; and the other is, in melancholic temperaments, a more or leſs torpid ſtate of the nervous power prevailing; in conſequence of which, various irregularities in the functions of the nervous ſyſtem ariſe.

ALL this would need much explanation, but I cannot attempt that here; and I do not think myſelf ſufficiently prepared to enter upon it fully. The only uſe I ſhall make of it at preſent is to ſay, that wherever morbid affections of the chronic kind can be perceived to depend upon a weakneſs of tone and mobility of the ſyſtem, chiefly appearing in ſymptoms of dyſpepſia, the bark is likely to prove an uſeful remedy; but that in the caſes of torpor, with firmneſs of tone, it is likely to be not only an uſeleſs, but even a hurtful remedy. The latter I take to be the caſe, in what I would ſtrictly name Hypochondriaſis. Of this, indeed, medical people have various notions, but ſeldom clear or well digeſted: and if ſome have aſſerted that they have found the bark uſeful in caſes of hypochondriaſis, I ſuſpect they have not properly diſtinguiſhed between hypochondriaſis and dyſpepſia. The latter may be frequently attended with timidity, doubt, and deſpondency; but it may ſtill be a very different diſeaſe from the proper hypochondriaſis.

I HAVE thus endeavoured to conſider the uſe of the bark in all the variety of diſeaſe in which it may be applied, or in which it has been commonly employed; and upon the ſubject it remains only to ſay, in what manner it may be moſt properly exhibited: but this I think I have done pretty fully on the ſubject of bitters; and I have only now to ſay, that every thing ſaid with regard to preparation and formula on the ſubject of bitters is entirely applicable to the bark.

SALIX ALBA.

THIS has been propoſed as a ſubſtitute for the bark; and upon that account I have ſet it down here. The teſtimonies of STONE, CLOSSIUS, and GUNZIUS, are very ſtrongly in its favour: and although we have not had many opportunities of employing it in intermittent fevers, the few that have been made ſhow that it may be in ſome caſes an effectual remedy.

THE ſenſible qualities ſeem to me to be that of a pretty ſtrong, but ſufficiently agreeable, bitter, with ſomewhat of ſtypticity. Theſe qualities perſuade me that it is a valuable medicine, and to be as promiſing a ſubſtitute for the bark as any I have known to be offered.

THE trials I have made were with the bark of the Salix Pentandra, taken from branches of a third of an inch diameter, and of four or five years growth. I muſt not, however, diſmiſs the ſubject without acknowledging that BERGIUS tells us, that ſeveral trials he had made with this bark in intermittent fevers were always without ſucceſs.

CHAPTER III.

OF EMOLLIENTS.

THESE are medicines which diminiſh the force of coheſion in the particles of the ſolid matter of the human body, and thereby render them more lax and flexible. Their action is moſt evident upon the ſimple ſolid; and they may poſſibly alſo act upon the ſolid matter of the moving fibres: but except it may be by the heat that is frequently joined with them, they do not ſeem, by their chemical qualities, to act upon the nervous power. The powers which act upon this in diminiſhing the contractility or tone of the moving fibres, will be conſidered hereafter, under the title of Sedatives.

THE emollients we are to treat of here, ſeem to act upon the parts to which they are immediately applied, in one of two ways. The one is, by being inſinuated into the ſubſtance of the ſolid; and thereby diminiſhing the denſity of the whole of the mixt, they diminiſh its force of coheſion. The other is, when, by being inſinuated into the interſtices of dry particles, they diminiſh the friction that might otherwiſe occur, and thereby render the whole more flexible. The former ſeems to be the operation of water, the latter that of oil; as we ſhall ſay more particularly hereafter.

THE operation of emollients is moſt conſiderable in the parts to which they are immediately applied; but as the whole of the ſolid matter of the body is conſtantly in a preternaturally extended ſtate, and as at the ſame time the ſeveral parts are ſo connected as to form one continuous body; ſo the tenſion of the whole muſt in ſome meaſure depend upon the tenſion of every particular part. It is therefore that the relaxation of any one part muſt in ſome meaſure affect the whole. It is, indeed, in this way that the effect of emollients is often extended much beyond the part to which they are immediately applied.

As, however, the effect of emollients is ſtill moſt conſiderable in the part to which they are immediately applied, it will be evident that their effect will be moſt conſiderable upon the ſurface of the body; and it is a queſtion how far they can be rendered ſo in the internal parts. Upon this ſubject it may be readily imagined, that as they may be applied to the internal ſurface of the alimentary canal, that their effect there may be very great: and although I would not maintain that they muſt be none at all, yet I am diſpoſed to think, that except in the mouth and fauces, or in the great guts to which they can be copiouſly and immediately applied, they cannot in the other parts of the alimentary canal be very conſiderable. The internal ſurface of the ſtomach and inteſtines are very conſtantly covered with a conſiderable quantity of mucus, not readily diffuſible in water, and therefore likely to prevent the inſinuation of water or oil into the ſubſtance of their coats.

THEIR effects here muſt alſo be leſs, as they are unaſſiſted by any additional heat, which is often required in their action upon the external parts: and another circumſtance which may prevent their action upon the alimentary canal is, that their application to any particular part can never be very durable; as water, the chief form of emollients, muſt be very quickly carried on in progreſſive motion, or quickly withdrawn by abſorption. I have known two pounds of water abſorbed from the rectum in the ſpace of an hour.

IF the action of emollients in the alimentary canal be in any meaſure doubtful, it muſt be ſtill more ſo with reſpect to the blood-veſſels. Here even a large quantity is ſlowly introduced; is ſoon very much divided; can never be applied in large quantity to any one part, and muſt always be mixed with a quantity of fluid not very penetrating. At the ſame time, it is applied to a ſurface conſtantly covered with an exudation not readily miſcible with water; and with all this it is conſtantly in a rapid progreſſive motion, by which it muſt be ſoon carried entirely out by the ſeveral ſecretions and excretions.

FROM all theſe circumſtances it would appear, that emollients, as watery, can hardly ever have any action in the ſyſtem of blood-veſſels: and therefore, to explain the action of emollients upon the ſyſtem of ſolids, I am almoſt confined to conſider only their action upon the external ſurface of the body, or in the parts immediately ſubjacent.

In conſidering the action of emollients upon the external parts, it may be a queſtion, whether water of a lower temperature than that of the body itſelf can act as an emollient?

WE are of opinion, that while water is at ſuch a temperature as to give a ſenſation of cold, it cannot have any emollient effect: but we know that if water of a temperature any thing above 62 in FARENHEIT's thermometer continues to be conſtantly applied, it ſoon ceaſes to give the ſenſation of cold which it gave on its firſt application; and after a ſhort time it gives a ſenſation of warmth. In this condition, that is, water of any temperature above 62, that is continued to be applied till it gives a ſenſation of warmth, may act as an emollient.

IT is however to be obſerved, that the greater the warmth, if within the bounds the ſkin will bear without pain, the greater its emollient power will be; both becauſe the heat will render it more penetrating, and becauſe the heat within the bounds mentioned contributes alſo to the ſoftening and relaxing the ſimple ſolids.

IT likewiſe appears to me that water penetrates more powerfully in the ſtate of vapour than in its liquid form; and as, in order to be converted into vapour, it requires a conſiderable degree of heat; ſo it is found that the human body will bear a greater degree of the heat of water, in the ſtate of vapour, than in its liquid form: and therefore, that cloths wrung out of boiling water, if ſo wrung as to give only a vapour, may be more ſafely applied, and with more advantage, as emollients, than liquid water.

THE application, however, of heat, muſt always be limited, ſo that the ſtimulus of the heat be noways inconſiſtent with the purpoſe of the emollient. Thus Dr WINTRINGHAM the elder has remarked, that warm fomentations applied to the pained joints at the beginning of acute rheumatiſm, increaſes the pain and aggravates the diſeaſe.

WHETHER emollients be applied in vapour or in a liquid form, it is found, that to give them effect it is neceſſary that the application be continued for ſome length of time; and therefore benefit is often obtained by the emollients being applied in the form of poultice; whereby both the moiſture and heat may continue to be applied for a long time.

There is a manner of applying emollients, or warm water as ſuch, by making it fall in drops from ſome height upon the part affected, and which by the French is called a *douche*. Whether in this manner the water penetrates more readily or fully into the ſubſtance of the part, I cannot poſitively determine; but I can hardly think it does: and am inclined to be of opinion that the *douche* acts only by a mechanical power, exciting an oſcillation in the veſſels of the part, which, analogous to friction, may ſometimes reſolve obſtructions, or excite the ſenſe and motion in paralytic parts. I can in no other way explain the effects of pumping water upon any part.

HAVING thus conſidered the operation of emollients in general, I proceed to conſider their effects on the human body more particularly.

As the cuticle is often in a dry and conſtricted ſtate, the application of emollients will ſoften and relax this, and thereby, in ſome meaſure, take off the tenſion of the ſubjacent parts. But it appears to me, that, in many caſes, the operation goes no further.

THE operation of oil ſeems to be chiefly upon the cuticle, compoſed very entirely of numberleſs dry ſquamæ, and between which oil being inſinuated renders them more readily moveable upon one another, and the whole, therefore, more lax and flexible.

As it may be preſumed that warm water or vapour penetrates, in ſome meaſure, into the ſubſtance of the ſkin itſelf, it will therefore relax not only the cellular texture of this, but likewiſe the coats of the numerous blood-veſſels laid in its texture. By this relaxation of the common teguments, the tenſion of the ſubjacent parts, particularly of the muſcles, muſt be conſiderably diminiſhed; and in proportion to the extent of that, the relaxation of the whole ſyſtem. The effects are more particularly to be obſerved when parts are under a ſtate of inflammation; as in that caſe the veſſels are diſtended, and thereby irritated; ſo the relaxation of theſe veſſels, by favouring the more free tranſmiſſion of the fluids, may thereby diminiſh the irritation which had perhaps been communicated.

As the action of the heart and arteries is often increaſed and ſupported by a ſpaſmodic conſtriction of the extremities of the veſſels on the ſurface of the body; ſo the relaxation of that conſtriction, by emollients applied, may often take off the irritation of the heart and arteries.

Emollients, by relaxing external parts, may take off ſpaſms of internal parts particularly connected with theſe; and thus the relaxation of the teguments of the lower belly often relieves the ſpaſms of the inteſtines which take place in colic and dyſentery.

Emollients applied to any one part, both by relaxation and ſtimulus, muſt determine the fluids more copiouſly into that part, and diminiſh the influx of them into others; and accordingly emollients, by relaxing the extremities of the veſſels on the ſurface of the body, muſt favour perſpiration and ſweat, as well as at the ſame time take off any determination to the internal parts:

Thus alſo pediluvia, when they do not prove ſtimulant to the ſyſtem, muſt diminiſh the determination of the blood into the veſſels of the head.

As the flexibility of the ſolids is increaſed by the more free and frequent motion of their particles upon one another; ſo, if the application of emollients be accompanied with much friction, the flexibility of the ſolids muſt be greatly increaſed by it, and particularly by its mechanical operation, the action of the blood-veſſels in general, as well as the more free motion of the fluids, muſt be greatly promoted, and thereby obſtructions may by this means be often removed.

It is further to be obſerved, that as the flexibility of the ſolids depends upon, and is maintained by, the motion of their particles upon one another; ſo, by long reſt, that flexibility is deſtroyed, and a rigidity induced, which is to be recovered chiefly by the employment of emollients with friction. The motion of a joint is frequently deſtroyed by the rigidity of one ſet of its muſcles contracted by the want of motion I have mentioned; and the motion of ſuch joints is only to be recovered by the cure of that rigidity in the manner I have juſt now ſaid.

Thus far with reſpect to the effects of emollients on the ſyſtem of blood-veſſels and of the moving fibres: but it is farther to be obſerved, that as the warmth and humidity applied to the ſurface of the body, are applied to the extremities of innumerable nerves terminating in the ſkin, and conſtituting there a peculiar organ of ſenſe; ſo it is probable, that this application has conſiderable effects upon the nervous ſyſtem, both by relaxing and ſtimulating, and may in this way contribute greatly to many of the effects above mentioned.

WE have now only to add, that the effect of emollients is hardly to be obtained but by their application long continued at one time; and we can hardly ever find the continuance of an hour leſs than ſufficient.

PARTICULAR EMOLLIENTS.

EMOLLIENTS are applied either in a watery or in an oily form; and the emollient that deſerves to be firſt mentioned is ſimple water, warmed either more or leſs. Whether any choice of water be very neceſſary, we are doubtful, as we believe that every kind of water which may be comprehended under the title of ſimple water, that is, water without taſte or ſmell, muſt be nearly of equal power as an emollient: but if a choice can be made, the ſofteſt water may have ſome little advantage over the hard.

THE virtues of water as an emollient may be underſtood from what has been ſaid of emollients in general; for all the effects there mentioned can be obtained moſt certainly by the application of ſimple water warmed. Whether any advantage can be gained by any addition made to water, I am doubtful. It is poſſible, that if oil can be blended intimately with water, this might perhaps carry the oil ſo blended with it into the interſtices of the ſolid parts, and thus more effectually induce a relaxation; but I know of one way only by which ſuch a mixture can be obtained, and that is, by adding to water the milk of any of our domeſtic animals: and as milk immediately taken from the animal that affords it, contains an oil already intimately blended with the water, ſo it may poſſibly, as common practice ſuppoſes, be an effectual emollient, either by itſelf or as added to water. This I preſume from theory; but I have not been able to perceive the

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emollient powers of milk to be greater than that of ſimple water. In Dr BRIAN ROBINSON's Table of the effects of different ſubſtances applied to hairs, marking the extenſions produced by different fluids, the cream of cows milk is 23$\frac{3}{10}$ths; cows milk ſkimmed is 26; water cold is 35; water hot is 80. That table might give occaſion to ſome remarks and reflections on the power of emollients, and I ſhall perhaps make ſome; but to conſider the whole, would lead to ſubtle ſpeculations, which, as I cannot find them applicable to practice, ſhall be paſſed over here.

PRACTITIONERS have commonly attempted to improve the emollient virtue of water, by employing the decoctions of ſeveral plants; but except it be thoſe of the mucilaginous kind, which I ſhall conſider by themſelves, I cannot perceive that any of the others are employed with advantage. The oleraceous plants, as the ATRIPLEX, BETA, SPINACHIA, and CHENOPODIUM *bonus Henricus*, have been employed; and ſome others alſo, as the ALSINE, ACANTHUS *branca Urſina*, MELÆLOTUS, PARIETARIA, and ſome others. But as none of theſe mentioned contain any thing mucilaginous, and that, by Dr ROBINSON's table above referred to, it appears that all ſaline matters joined with water render it leſs penetrating; ſo I judge the plants mentioned as emollients to be abſolutely inſignificant. In ſome liſts of emollients, as in that of Mr LIEUTAUD, there are ſtill greater inaccuracies to be found. Amongſt the emollients, he inſerts the radices nymphææ et lapathi, which are aſtringents; the flores chamamæli and ſambuci, which may have their virtues, but are not emollient, except in ſo far as they are accompanied with warm water.

OF the vegetable ſubſtances which, joined with warm water, may be ſuppoſed to increaſe the emollient powers of this, are eſpecially thoſe that afford a mucilage, as the roots and herbs of the *Columniferæ*; all of which give out more or leſs of a mucilaginous matter. The ALTHÆA and MALVA are thoſe chiefly employed. Their demulcent virtue ſhall be conſidered in its proper place hereafter: and, as emollients, which gives them a place here, I judge them to be very inconſiderable, as I think they muſt rather impede than increaſe the ſolvent power of water. The only advantage that can be derived from them ſeems to be, that as warm water waſhes off any unctuous matter that commonly beſmears the cuticle; ſo, when the water is again evaporated, it leaves the cuticle more dry than it was before: and it is poſſible that water impregnated with mucilaginous matter, in being again evaporated, may leave ſome portion of the mucilaginous matter behind, and thereby obviate the dryneſs of the cuticle which might otherwiſe occur.

FOR impregnating water with mucilaginous matter, a great variety of farinaceous ſeeds have been employed; and thoſe eſpecially which have much oil blended with their farina, as the lintſeed, have been properly preferred. This, and the others that might be employed, will come under conſideration hereafter, under the title of Demulcents. And with reſpect to them now as emollients, I have the ſame obſervations to make as I have made juſt now with reſpect to mucilages: and I am perſuaded, that the more oily nature of the farinacea will ſtill more diminiſh the emollient virtue of water; but in another reſpect they may have ſome advantage. As we have ſaid that emollients may have more durable effects, as applied in the form of poultice; ſo, as the farinacea are commonly employed for this purpoſe, the more oily kinds, as leſs liable to dry, will always be the beſt. Whether, however, the adding of oil or unguinous matter to a poultice of other farinacea, may not anſwer the purpoſe better, I leave to the ſurgeons to determine.

THE other form of emollients is the oily; and all the mild oils of vegetables, and all the oils and fats of animals, have been employed as emollients. The operation of them in general I have mentioned above; and it is chiefly that of producing a greater flexibility in dry matters. In this way they operate eſpecially upon the cuticle; and may thereby, in ſome meaſure, take off the tenſion of the ſubjacent parts. That the mild oils we have mentioned ever penetrate into the ſubſtance of the ſkin, I cannot perceive; and when they are ſeemingly taken in from the ſurface, I believe it is always by abſorbing veſſels. This abſorption, though it certainly takes place, is certainly never in conſiderable quantity; and in being carried on by the abſorbing veſſels, cannot be ſuppoſed to have much, if any, effect in any of the parts through which theſe veſſels paſs.

As we have obſerved above, that friction, joined with the application of emollients, may be of ſervice in exciting the action of the veſſels, ſo this friction can only be applied conveniently with oil anointed on the fingers or hands employed in rubbing; and this opportunity of friction is one great advantage obtained by the employment of oils. The effects of very gentle friction, long continued, ſeems to be very conſiderable, by its exciting a conſtant oſcillation in the veſſels of the ſubjacent parts; and by the oſcillations excited in the nerves of the ſkin, theſe effects may be propagated to very diſtant parts. I know from my own experience of it, that by a friction with oil long continued upon the teguments of the lower belly, the action of the urinary paſſages may be ſtrongly excited, and a copious flow of urine be produced. This practice, indeed, does not always ſucceed;

but

but it has in ſeveral inſtances, and I have never found it do any harm.

It has been commonly ſuppoſed, that the application of oil to the ſkin might ſtop up its pores, and hinder perſpiration; but, from ſeveral conſiderations, it appears that there is no juſt foundation for this: and the very general practice of the ancients, as well as of the Aſiatics in modern times, is a certain proof of the contrary.

For the purpoſe of oily emollients, a great number of oily ſubſtances have been propoſed and employed; and among theſe commonly propoſed, I cannot find much difference. The various mild expreſſed oils of vegetables are all of them very nearly of the ſame nature; and if any diſtinction was to be made, it would be by chooſing the moſt fluid in preference to the more mucilaginous: and, on this footing, I would prefer the oil of olives to that of lintſeed. From the ſame conſideration, I would prefer the vegetable oils to the animal fats; but this hardly deſerves attention in practice. Among the animal fats, practitioners ſome time ago made a choice, and ſuppoſed that the fats of certain animals had peculiar virtues; but the ſuppoſition ſeems now, at leaſt in Britain, to be very entirely abandoned; and I cannot perceive that there ever was any foundation for it. Some of them in pharmacy, may, by their conſiſtence or colour, be better ſuited than others to certain formulæ: but that is now ſo well aſcertained in common practice as to need no illuſtration here.

CHAPTER IV.

CORROSIVES.

THESE are otherwiſe called Cauſtics, Erodents, and Eſcharotics. They are all of them ſubſtances which diſſolve the ſolid matter of the human body; and they are indicated in all thoſe caſes in which either a portion of the ſolid matter is to be taken away, or when the texture of it is to be deſtroyed, ſo as it may either ſpontaneouſly fall off, or, by mechanical means, may be eaſily ſeparated from the other parts. When ſuch an indication ariſes, I leave my readers to learn from the principles of ſurgery; and alſo, from the ſame, to learn when this method is preferable to that of a mechanical exciſion.

THE operation of cauſtics, whilſt any living principle ſubſiſts in the part to which they are applied, is always attended with pain, and may thereby prove a conſiderable irritation to the whole ſyſtem; but this is an effect in common to theſe with many other ſtimulants, and is not therefore to be conſidered here, but under the general head of ſtimulants, in the next article. The ſame thing is to be ſaid of their uſe in exciting a diſcharge of pus; which, as it may be done by other means, is not neceſſary nor proper to be conſidered here. It only remains for us, in this place, to ſay what the particular corroſives are, with ſome remarks on their difference, for the purpoſes of practice.

As ſolvents of animal matter may be mentioned in the firſt place, the acids which can be obtained in a very concentrated ſtate, ſuch as the vitriolic and nitrous; theſe, therefore, may be employed as cauſtics: but their fluidity makes it difficult to confine their application to the parts which are only to be properly conſumed, and therefore it is that they are ſeldom employed.

THE cauſtic moſt generally employed is the fixed alkaline ſalt, when ſeparated from the aerial acid which commonly accompanies it: and accordingly, when it is thus ſuited to the purpoſes of the preſent indication, it is ſaid to be in its cauſtic ſtate. How the common fixed alkali is brought into this ſtate, and how it is to be managed as a cauſtic, are matters vulgarly known, and not neceſſary to be mentioned here. Dr EDWARD BARRY, in the Edinburgh Medical Eſſays, has propoſed the employment of a cauſtic of acid and alkali alternately applied. The ſcheme is ſpecious, but has not ſucceeded with us; and I believe will not at all anſwer except where large maſſes are to be conſumed, and where the ſpreading of the acid can do no harm.

THE cauſtic qualities of acids, though entirely deſtroyed by their being combined with alkalines and earths, are not ſo by their being combined with metals. The nitrous acid combined with ſilver, gives the lunar cauſtic very commonly employed; and the muriatic acid, in a concentrated ſtate, joined with antimony, gives what is commonly called the butter of antimony, one of the ſtrongeſt cauſtics known. Theſe metallic cauſtics are attended with the ſame inconvenience as the ſimple acids;

that

that is, of being ready to ſpread beyond the bounds intended for them: but this is more eaſily managed with reſpect to the lunar cauſtic, which can be got in a ſolid form, than with reſpect to the butter of antimony, neceſſarily liquid; and this gives the reaſon why the latter is more rarely employed.

It is here to be obſerved, that theſe corroſive matters are in different degrees of ſtrength; and when they are not ſufficient to diſſolve the more ſolid parts, they ſtill may be fit to diſſolve thoſe more tender fungous excreſcences which ariſe in ulcers. Thus it happens, that alum having a conſiderable portion of its watery parts exhaled, and its acid thereby concentrated, is thereby rendered capable of conſuming the fungous growth in ulcers. It is, however, always a weak eſcharotic; and we have a ſtronger kind in the preparations of mercury and copper. Both theſe preparations are noted for their cleaning foul ſores, bringing them to diſcharge a proper pus, ſo neceſſary to their healing; and I aſcribe all this to their eſcharotic power.

A specific power might, in certain caſes, be ſuppoſed in the mercurials; but this cannot be ſuppoſed in the preparations of copper, which, however, often anſwer the purpoſe as well. In practice, the force of the latter cannot be ſo well meaſured or limited as the former; and therefore the dry red precipitate, as leſs liable to liquify and ſpread, is commonly the moſt convenient application. It has been common to mix this with unguinous matters; but this very much diminiſhes its power, and is very ſeldom neceſſary.

CHAPTER V.

OF STIMULANTS.

ACCORDING to the plan laid down in our prefixed table, we are now to conſider the medicines that act more entirely upon the living ſolid.

THE idea commonly annexed to the term Stimulant, is that of a power ſuited only to excite the action of moving fibres; but I am here to conſider ſtimulants more generally, as exciting the motion of the living principle, whether producing ſenſation or as producing the action of moving fibres.

VERY generally, indeed, the motions begin in the former: but it is not neceſſary, as ſome have ſuppoſed, that they ſhould always do ſo; for there are powers which, directly applied to the moving fibres, excite their action without any previous ſenſation excited, or without any intervention of the brain; which appears clearly from hence, that the motion of moving fibres can be excited ſo long as the living principle ſubſiſts in them, though they are entirely ſeparated from the reſt of the body, and entirely therefore removed from all ſenſe.

THE operation of ſtimulants, either in an extenſive or more limited view, is difficult to be explained; becauſe our knowledge of the living principle or nervous power, and of the various modifications of the different ſtates of its mobility, is ſtill very imperfect. Some have imagined, that the operation of ſtimulants might be mechanically explained by the figure of their particles; but while the Corpuſcularian philoſophy is at preſent ſo much deſerted, we do not think it neceſſary to take any pains to diſcuſs the futilities advanced on this ſubject: and however it may be, it ſeems enough to obſerve, that we know in general that the nervous power may be in different ſtates of mobility, and that there are ſubſtances which, applied to the nerves, have a power of increaſing or diminiſhing the mobility of the fluid contained in them. The former we name Stimulants, the latter Sedatives.

THIS then is the general idea of ſtimulants, That they are powers capable of increaſing the mobility, and of exciting the motion of the nervous power. Here, however, it is proper to remark, that by the nervous power being acted upon by ſtimulants, we ſtrictly mean not only that fluid which is readily moveable in the brain and nerves, but alſo that fluid which is under a peculiar modification in the moving fibres, and gives them what we name the inherent power. It is fit alſo to remark here, that in this manner we muſt diſtinguiſh between ſtimulant and tonic powers, which both act upon the ſame power, and have been commonly confounded together. Although they may mutually increaſe the effects of each other, they are ſtill in their nature and operation to be conſidered as diſtinct and different, though we cannot clearly explain wherein the difference conſiſts.

HAVING thus given my general idea of the operation of ſtimulants, I proceed to conſider the various modifications of that operation as it is determined either by the circumſtances of the parts of the body to which they are immediately applied, or by the various nature of the ſubſtances that may be employed to act.

IN the firſt place, we ſhall conſider them as they are applied to organs of peculiar ſenſe, which are excited by the impreſſions of certain matters only; or as they are applied to parts which have a ſenſibility in common with the whole of the nervous ſyſtem, and when their effects are modified by the ſtate of the moving fibres in the parts adjoining.

WITH reſpect to the whole of the ſtimulants applied to the organs of ſenſe, we have to remark, that the exerciſe of ſenſation is in general a ſtimulant power, and is a chief means of ſupporting the mobility of the living principle in the nervous ſyſtem; more eſpecially in what concerns the animal functions.

IT relates alſo to all the caſes in which ſenſation is produced, to remark, that the effects of the ſtimulus ſeem to be in proportion to the force of the impreſſion producing them. As a certain degree of this is on many occaſions neceſſary to render them pleaſant; ſo in proportion to the pleaſure ariſing from them, their ſtimulus is greater: and farther, as all ſtrong impreſſions give pain; ſo in proportion to this alſo, they are more ſtrongly ſtimulant.

FROM certain other circumſtances beſide that of force, ſenſations are either agreeable or diſagreeable; the former being always ſtimulant; the latter being, as I judge, always ſedative, or perhaps indirectly ſtimulant, as we ſhall explain hereafter.

OF particular ſenſations, theſe of light and noiſe have their ſtimulant effects in proportion to their force; or ſometimes independent of that, according to certain circumſtances rendering them more agreeable.

ODOURS are very much on the ſame footing, but have often more immediate and ſtrong effects on the ſenſorium; and to explain that, it may be obſerved, that with reſpect to other parts of the ſyſtem, the medical virtues of many ſubſtances ſeem to depend upon their odorous parts; which ſeems to point out their particular activity with reſpect to the nervous ſyſtem.

SAPID bodies do not ſo readily or powerfully affect the ſenſorium; but the activity of ſapid ſubſtances applied to other parts, often correſponds with the force of their impreſſions upon the tongue.

IN conſidering the operation of ſubſtances upon the ſkin, it is not always eaſy to diſtinguiſh the effects of impreſſions applied to what is ſtrictly the organ of ſenſe, from the effects of impreſſions made upon that ſenſibility which the ſkin has in common with all the other parts of the nervous ſyſtem.

IT ſeems to be an operation on the nervous papillæ of the ſkin, when a certain gentle undulatory motion applied to the ſkin produces a ſenſe of tickling, which often proves ſtimulant. It is alſo chiefly an operation not only upon the ſame organ, but partly alſo upon that of the common ſenſibility; when certain ſubſtances applied to the ſkin produce a ſenſe of itching, which is always ſtimulant, and often continues till it produces redneſs and other circumſtances of inflammation.

THESE are the obſervations which I can make on the action of ſtimulants applied to organs of ſenſe: and this in general is to be remarked, that though we ſhould expect that impreſſions upon theſe organs ſhould be eſpecially and only communicated to the brain, and although, which is truly the caſe with all moderate impreſſions, exciting peculiar ſenſations, which for the moſt part act only upon the brain, and little or none at all either upon the organ itſelf, or upon the parts immediately adjoining to it; yet all ſtrong impreſſions ſeem to act very often more on the neighbouring parts than upon the brain or general ſyſtem depending upon it.

THE action upon the neighbouring parts ſeems to be eſpecially the exciting of the action of the blood-veſſels of the part immediately adjoining to the organ of ſenſe. Thus, a ſtrong light excites a ſtronger action in the numerous blood-veſſels intermixed with the nerves of the retina. What happens in the ear we do not know; but ſtrong odours inflame the internal membrane of the noſe, and ſtrong and painful impreſſions upon the tongue inflame the ſurface of it. What happens on the ſkin I have mentioned before; and I gave that as an example of the action of ſtimulants, both on parts which are not organs of peculiar ſenſe, and on thoſe which have only the common ſenſibility of the nervous ſyſtem. Such are alſo all the internal ſurfaces in which therefore we perceive only the effects of ſtimulants by their producing inflammation on their ſurfaces.

BUT we are now to conſider the operation of ſtimulants upon the parts that are endued only with the ſenſibility that is in common to the whole of the ſyſtem; and we cannot illuſtrate this better than by marking their action upon the ſkin.

WHEN certain ſubſtances are applied to the ſkin, the firſt ſenſation they produce is that of heat in the part; and commonly at the ſame time ſome redneſs appears upon the ſurface, which I take to be a mark of an operation upon the blood-veſſels of the ſkin. There is frequently, indeed, at the ſame time, a ſenſe of pricking pain; yet often without that, the effect chiefly conſiſts in an increaſed action of the veſſels mentioned, and which accordingly proceeds to every circumſtance of inflammation, as pain, tumour, bliſtering, ſuppuration, and gangrene. In many caſes, ſome of theſe effects are produced in the part, without their being communicated to the reſt of the ſyſtem; and I conſider them therefore as an immediate operation upon the moving fibres of the veſſels of the ſkin, without the intervention of ſenſation or of any action of the brain.

IT is indeed true, that, in many caſes, a ſenſation ariſes, and that a ſtimulus is communicated to the brain, and the ſymptoms of its increaſed energy as a preternatural frequency of pulſe; and, in conſequence of this, an increaſe of heat over the whole body are produced. But it is to be remarked, as often happening, that the ſtimulus communicated to the brain is not in proportion to the inflammation produced in the part, which we have occaſion frequently to obſerve in thoſe paralytic caſes in which we apply inflammatory ſtimulants to particular parts.

THESE are the general effects of ſtimulants on the parts to which they are immediately applied: But I am now to mention what is a very important particular of the animal œconomy, which is, That many ſtimulants have little effect on the parts to which they are immediately applied, but excite motions in other, and ſometimes very diſtant, parts of the body. Theſe motions, however, have commonly a relation to the parts to which the ſtimulus had been immediately applied; and they are commonly ſuch as are ſuited for throwing off the ſtimulant matter from thoſe parts.

SUCH are the motions of ſneezing, hawking, coughing, vomiting, and the voiding of urine and feces. In all of theſe, the motions are excited by an uneaſy or painful impreſſion from a matter applied to certain parts; and the motions excited are manifeſtly fitted for throwing off the irritating matter from theſe parts.

THESE phenomena have been commonly explained upon the ſuppoſition of a certain conſent of nerves between thoſe of the parts irritated and of the parts acting; but no particular connection of nerves can be found that will account for the exciting of theſe actions, without their exciting at the ſame time many others; and it muſt be referred to an inſtitution of nature which we cannot explain, and can only ſay, that the motions excited are ſuited to the general purpoſe of nature, either to reſiſt and avert injuries from external cauſes threatening the animal œconomy, or to produce certain actions neceſſary to that œconomy. Of the latter kind are the evacuations of ſtool and urine; and of the former are the other motions of ſneezing, hawking, coughing, and vomiting.

IN illuſtration of this, it may be remarked, that the ſame actions are produced by ſtimuli applied to very different parts, if theſe actions are ſuited to the purpoſe, as we may call it, of theſe different parts. Thus a full inſpiration and a concurring contraction of the abdominal muſcles is produced by a ſtimulus applied to the ſtomach, or by an uneaſy ſenſation at the neck of the bladder, or by a like ſenſation in the inteſtinum rectum.

THESE may ſeparately excite the full inſpiration; not therefore from any particular conſent of nerves, but merely from its being neceſſary to the purpoſe of nature: and accordingly it is excited, not only on theſe occaſions, but on every other where nature intends a ſtrong exertion of ſtrength, to which a full inſpiration is always neceſſary.

IT is farther to be remarked, that it is the adminiſtration of nature in the buſineſs of the animal œconomy, which not only excites thoſe motions, but alſo regulates the force with which they are exerted to be more or leſs, according as the occaſional circumſtances may require. Thus, a ſenſation that excites to an evacuation of urine, if the urinary bladder be full, and there is no reſiſtance to the iſſuing of the urine, the inſpiration produced will be to a very moderate degree only; but if there is a reſiſtance to the evacuation of urine, the inſpiration and other concurrent actions are excited to a greater degree and with greater force.

THAT the buſineſs in ſuch caſes is directed by the purpoſe of the œconomy, and not by the conſent of nerves, appears further from hence, that it is not one ſet of actions, all of them conſtantly excited by the ſame ſtimulus, but more or fewer, according to the ſtrength of effort that is neceſſary. Thus, the ſenſation exciting an evacuation by ſtool, according to the force on that occaſion to be exerted, produces the action of more or fewer parts of the body. Not only a very full inſpiration and a ſtrong contraction of the abdominal muſcles are produced, but a contraction, in order to a general tenſion, takes place in almoſt every muſcular fibre of the body. The fiſts are clinched, or the hands graſp ſome fixed body very firmly; and even the muſcles of the cheeks are often very ſtrongly contracted.

There may ſeem to be ſome myſtery in all this; but no body will be ſtumbled with reſpect to this part of the animal œconomy who conſiders the ordinary operation of the will. This does not directly or conſciouſly direct the action of any particular muſcle; but willing only an end and purpoſe, the muſcles fitted to execute or produce this end are immediately brought into action.

The actions we have mentioned are the effects of ſtimuli, which we ſuppoſe to be powers exciting the motion of the nervous power; and though the effects are determined by the will or propenſity, we ſtill ſuppoſe the general power of the ſubſtance acting, and are therefore what we call direct ſtimulants: It is now, however, to be remarked, that there are motions excited in the body without the application of ſuch ſtimulants, and by circumſtances of a contrary kind; that is, merely by a ſenſe of difficulty, of reſiſtance, or of debility, in the exerciſe of functions.

Thus, ſighing manifeſtly ariſes from a ſenſe of difficulty in the tranſmiſſion of the blood through the veſſels of the lungs. Coughing often ariſes from the ſame ſenſation, without any direct ſtimulus applied to any particular part of them. Vomiting often ariſes merely from a ſenſe of debility, as when it accompanies a ſyncope, from cauſes which cannot be ſuppoſed to operate directly upon the ſtomach; and the vomitings ſo frequently produced by narcotics ſeem to me to be more properly explained by a ſenſe of the debility induced by them, than by their affording any direct ſtimulus. We explain in the ſame manner the yawning and ſtretching which occurs to perſons coming out of ſleep, and on ſome other occaſions, when no other cauſe can be ſuppoſed than a ſenſe of ſome difficulty in the exertion of voluntary motions.

THESE ſeem to afford unqueſtionable proofs of a power in the animal œconomy, to obviate and correct certain deviations from the ſtandard of health; and both theſe, with the inſtances given above of direct ſtimuli producing motion ſuited to throw off matters applied which give pain and uneaſineſs, or that may prove noxious to the ſyſtem, concur in ſhowing, that there is in the animal œconomy a power to obviate and correct, in a certain degree, every thing not ſuited to the health of the œconomy, and which has properly enough been named the Vis Naturæ Conſervatrix et Medicatrix.

AFTER ſo many evident inſtances of this, we can hardly doubt of the like powers taking place alſo in the more obſcure internal parts, in many caſes of diſeaſe which are ſpontaneouſly cured by the operations of nature; or in other words, by the ſpontaneous powers of the animal œconomy, and particularly that the ſtate of the circulation is often regulated ſo as to be excited to a ſtronger action, merely by the occurrence of reſiſtance or debility. All this particularly applies to render it probable, that the effect of ſedatives, exciting the action of the ſyſtem, either in general, or of particular parts, may be explained entirely by their being effects of a vis medicatrix naturæ, obviating injuries which threaten the whole ſyſtem or particular parts: and to finiſh this ſubject, nothing can better ſhow that active powers can be excited merely by a ſenſe of debility, than this, that a ſtimulus accuſtomed to ſupport the activity of the ſyſtem, happen to be withdrawn, the ſenſe of debility thence ariſing produces various actions in the ſyſtem, or in particular parts. All theſe means of exciting the action of the ſyſtem, or of particular parts, we name *Indirect Stimulants.*

AFTER thus mentioning the operation of ſtimulants as chiefly applied to external parts, we proceed to conſider their application to the internal; and which is eſpecially by their being taken into the ſtomach. Here they may operate, in the firſt place, upon the moving fibres of the ſtomach itſelf, exciting their action for the purpoſes of digeſtion; or to a higher degree, for exciting vomiting, which we ſhall conſider hereafter under the head of Evacuations: or, in the ſecond place, ſtimulants may act on the ſtomach as a peculiar organ of ſenſe. Here it is ſurely needleſs to ſay how readily and conſtantly all impreſſions made upon the ſtomach are communicated to other parts of the ſyſtem, and particularly to the origin of the nerves.

IT is poſſible that impreſſions made upon the ſtomach, without the intervention of the brain, may be communicated to ſeveral parts of the ſyſtem, and particularly to the ſurface of the body, or to parts under diſeaſe, and therefore under a ſtate of uncommon irritability; but theſe are uncommon occurrences, and I cannot readily aſcertain, with any clearneſs, the circumſtances and caſes in which theſe eſpecially occur. I believe the moſt common and very general manner in which ſtimulants taken into the ſtomach operate is by their ſtimulus being communicated to the brain; and that by exciting the energy of that, various effects are produced in different parts of the ſyſtem.

UPON theſe occaſions the operation may be eſpecially diſtinguiſhed, as being of different degrees of force. In ſome caſes, it ſeems to amount to no more than the increaſing of the mobility of the nervous power in the brain itſelf, and thereby rendering the exerciſe of the intellectual powers more free, eaſy, and active. Probably, at the ſame time, or at leaſt with ſome higher degree of force, they render the derivation of the nervous fluid into the ſeveral parts of the ſyſtem, eſpecially into the nerves of the voluntary functions, more free and full; without, however, producing any uncommon increaſe of it in particular parts to which a will or propenſity is neceſſary.

ANOTHER caſe of ſtimulants applied to the ſtomach, is when the ſtimulus applied is of a ſtill ſtronger kind; and in conſequence, a ſtronger impulſe is communicated to the brain, and when conſequently a ſtronger exertion of its energy is produced. This, however, without particular determination, may have no effect on the animal functions; but as we have ſaid before, that the energy of the brain is conſtantly exerted in ſupporting the activity of the vital functions of the heart and arteries; ſo any unuſual increaſe of this exertion may increaſe the force and frequency of theſe functions. Thus the effects of certain impreſſions on the ſtomach may be to increaſe the force of the circulation of the blood, and eſpecially its moſt general determination to the ſurface of the body; whence the heat and ſweating which commonly enſues. Thus the operation of ſtimulants in the ſtomach, may be diſtinguiſhed by the different degrees of its force: and this, I expect, will ſerve as a foundation for the conſideration of particular ſtimulants hereafter.

THE operation of ſtimulants taken into the ſtomach is not always exhauſted there; for they are often carried on, very much unchanged, into the inteſtines; and there alſo operate, in the firſt place, upon the fibres of the inteſtines analogous to the like operations upon the ſtomach. They increaſe and render more ſteady the action of the moving fibres; and I have no doubt that the ſtimulant power from the inteſtines, as well as from the ſtomach, may be communicated to the brain, though it is probable that the ſtomach is endowed with more ſenſibility ſuited to this purpoſe.

THE action of ſtimulants on the inteſtines to ſuch a degree as to produce purging, I delay conſidering, as I have done that of vomiting, till I come to treat of evacuations.

As many of our ſtimulants are very little changed in the alimentary canal, ſo they are carried with their entire power into the blood-veſſels; and we are therefore to conſider what may be their operation there. We judge it to be very little; 1ſt, Becauſe they are there neceſſarily diffuſed in a great quantity of liquid, which muſt very much weaken, if not entirely deſtroy, their operation. 2dly, Becauſe they are there involved in a quantity of viſcid fluid; ſuch as we know, in all caſes, to weaken the action of ſtimulants. And, laſtly, Becauſe we believe the internal ſurface of the blood-veſſels to have very little ſenſibility, and therefore little liable to be affected by weak impreſſions. From all theſe conſiderations, we conſider the operation of ſtimulants, taken in by the mouth, to be in the blood-veſſels very little; and know of no obſervation or experiment that leads us to think otherwiſe. I am of opinion, that any ſuch effects as have been ſuppoſed can be better explained by their operation on the ſtomach and brain.

WE ſtill, however, know that many ſtimulant matters are carried into the blood-veſſels, and are carried off by ſeveral excretions: and as we may juſtly impute their inert ſtate in the blood-veſſels to their being there extremely diffuſed; ſo, when they are again accumulated, and as it were concentrated in the ſecretory organs, they may there operate in promoting the different ſecretions. Of this we have many inſtances; but I delay conſidering them till I ſhall come to treat of the evacuations they occaſion.

To give a full treatiſe of ſtimulants, we ſhould conſider the powers of heat, cold, and electricity; but as not ſtrictly belonging to the Materia Medica, we paſs them over here.

HAVING now conſidered the operation of ſtimulants in general, I have only to conclude the ſubject with mentioning, that with regard to all of them, they are ſubjected to the laws of cuſtom; and that, therefore, conſidered as impreſſions, their power by repetition is conſtantly diminiſhed; but that, conſidered in their effects, the actions produced by the repetition may become more readily excited, and thereby the power of ſtimulants may ſeem to be increaſed.

PARTICULAR STIMULANTS.

WE begin by mentioning thoſe which, with a botanical affinity, have much of a common virtue: and in the firſt place, therefore, the

A. VERTICILLATÆ.

THESE are a numerous order, many of which have their virtue depending upon an eſſential oil, largely abounding in them, as produced by nature. As, however, the effect of botanical affinity is not complete in exhibiting the ſame qualities in all of the ſame order; ſo thoſe of the verticillatæ, which have little or no eſſential oil, ſuch as the bugula, brunella, and lamium, are neglected as medicines: or if there be ſome which, with little eſſential oil, are ſtill retained in practice, it is on account of the bitter and aſtringent qualities which are found in many of this order. Even of thoſe abounding in eſſential oil, all are not here enumerated; as, though they have the common qualities, they have them not in a higher, or perhaps not in ſo high a degree, as thoſe more common in our ſhops. But to be ſtill more particular, I begin with

BETONICA.

THIS, though formerly much celebrated, is now omitted in the catalogues of the Britiſh diſpenſatories; and, in my opinion, very juſtly, as it has the common qualities of the verticillatæ in a very ſlender degree: and I mention it here merely as an example of what frivolities are repeated after ancient writers, and alſo as an example of very ill-grounded popular opinions which have prevailed not long ago. ANTONIUS MUSA, the phyſician of Auguſtus Cæſar, is ſaid to have given a treatiſe on betony; in which he has mentioned this plant as a remedy againſt forty-eight different diſeaſes; and amongſt the Italians it has been conſidered of ſo great and almoſt univerſal virtue, as to introduce the maxim of *Vende la tonica e compra la Betonica.*

HEDERA TERRESTRIS.

THIS is another inſtance of the uncertainty of popular opinions, however generally prevailing; and the opinion of the Engliſh of the hedera terriſtris, ſeems to me to be no better founded than that of the Italians juſt now mentioned.

THE ſenſible qualities of the hedera terreſtris do not promiſe much virtue, either in its recent ſtate or in any of its preparations; and CARTHEUSER's account of the extract I ſuppoſe to be founded on ſome miſtake, as the ſame qualities do not at all appear in the extracts from a recent plant, which we have prepared with all poſſible care.

WITH reſpect to this plant, the accounts given of it by materia medica writers ſeem to me to be no better founded than the opinions of the vulgar. That it ſhould be powerful in curing ulcers of the lungs, and various caſes of phthiſis, ſeems to me very improbable; and the authority of Simon Paulli, or of the others adduced on this ſubject, have very little or no weight with me againſt the conſideration of the nature of ſuch diſeaſes, and of the general difficulty of curing them. Its uſe in calculous caſes is not ſupported by any better authorities, nor with any greater probability; and I ſhould have no fear of exceſs in employing it *.

DR MEAD's particular manner of employing it, by joining it with fermenting ale, appears to me frivolous. In ſhort, in many caſes in which I have ſeen it employed, I have had no evidence of either its diuretic or of its pectoral effects. In common with many other of the verticillatæ, it may be employed as an errhine, and in that way cure a headach; but no otherways by any ſpecific quality.

HYSOPUS.

THIS abounds with more eſſential oil than the foregoing, and has at the ſame time more of a warm bitter joined with it. It ſhould therefore be a more active medicine; but how this activity

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* Murray, App. II. 177.

vity may be beſt directed, I am quite uncertain. How the eſſential oils of this, and others of the verticillatæ, ſhould be ſuited to operate particularly upon the veſſels of the lungs, I cannot perceive. Hyſop, however, has always had the reputation of being pectoral; although in many trials I have not ſeen its effects. Formerly the diſtilled water was much employed as a pectoral in this country, in the caſes both of children and adults; but the efficacy of it has been ſo little obſerved by our practitioners, that it is now omitted in our diſpenſatory.

Its effects in reſolving coagulated fluids, for reaſons given above, I can hardly admit of: but as the vapour of eſſential oils, externally applied, may excite the action of the blood-veſſels; ſo it is poſſible that hyſop, as well as ſeveral other of the verticillatæ, may be uſefully employed in contuſions and other caſes of ſtagnating fluids. It is poſſible that like applications may be uſefully applied to ſome contuſions of the eyes; but in moſt inſtances of the common ophthalmia, I have generally found any warmth applied to the eyes to be hurtful.

THE vermifuge qualities of hyſop are hardly eſtabliſhed by the ſingle inſtance of its effects which VAN ROSENSTEIN has given us.

LAVENDULA.

THIS contains a large portion of eſſential oil of a very grateful odour. It is therefore, whether externally applied or given internally, a powerful ſtimulant to the nervous ſyſtem; and among the others of this order named Cephalics, the lavender has a very good, and perhaps the beſt, title to it.

IT is to me probable, that it will ſeldom go further than exciting the energy of the brain to a fuller impulſe of the nervous power into the nerves of the animal functions, and ſeldom into thoſe of the vital. It may, however, be with great propriety that Profeſſor MURRAY has diſſuaded its uſe, where there is any danger from a ſtimulus applied to the ſanguiferous ſyſtem. It is however ſtill probable, that lavender commonly ſtimulates the nervous ſyſtem only, and therefore may be more ſafe in palſy than the warmer aromatics, eſpecially if the lavender be not given in a ſpirituous menſtruum, or along with heating aromatics, which, however, is commonly done in the caſe of the ſpiritus lavendulæ compoſitus.

IT is hardly neceſſary to remark here, what is now ſo commonly known, that the verticillated plants we are treating of give out a larger proportion of eſſential oil, after their being dried for ſome time, than in their recent ſtate; but it is not ſo commonly obſerved, that moſt of them, in their firſt diſtillation, give out along with their eſſential oil a quantity of mucus or butyraceous matter, and that they may be freed from this, and much improved in their fragrance and virtues, by a ſecond diſtillation with water. It is alſo to be remarked, that all theſe plants afford a larger proportion of eſſential oil, according as they are allowed to grow to their full maturity, and eſpecially as they grow in light, ſandy, or gravely ſoils.

MARJORANA.

THIS plant alſo contains much eſſential oil of a pleaſant odour. From hence it has the ſame cephalic and diſcutient qualities with lavender, and which therefore we need not repeat here. We have already obſerved, that many of the verticillatæ ſnuffed up the noſe prove powerful errhines; and in this reſpect there is none more powerful than the marjorana. On this account, therefore, and on account of its agreeable odour, there is none more frequently or more properly employed than this in our ſternutatories.

MENTHA SATIVA

CONTAINS much eſſential oil, but of an odour ſomewhat leſs agreeable than that of lavender or marjorum. It is therefore leſs employed as a cephalic; but it acts very powerfully on the parts to which it is immediately applied, and therefore conſiderably on the ſtomach, invigorating all its functions. It acts eſpecially as an antiſpaſmodic; and therefore relieves pains and cholic depending on ſpaſm. It will alſo ſtop vomiting depending on ſuch a cauſe; but there are many caſes of vomiting in which it is of no ſervice: and in theſe caſes, anywiſe depending upon inflammatory irritation in the ſtomach itſelf, or in other parts of the body, it aggravates the diſeaſe, and increaſes the vomiting. Practitioners have thought, and I think juſtly, that the infuſion of mint in warm water agrees better with the ſtomach than the diſtilled water, which is often ſomewhat empyreumatic.

THE effects of mint in preventing the coagulation of milk, which have been mentioned in authors, do not appear in my experiments; and if it be found uſeful in reſolving indurations in the breaſts of nurſes or of lying-in women, I aſcribe it to the diſcutient virtue of the verticillatæ, which we have already mentioned on the ſubject of hyſop.,

THE ancients have tranſmitted to us an opinion, that mint has the power of weakening the powers of venery in men, and this has been repeated by ſome moderns; but it is very inconſiſtent with the power at the ſame time aſcribed to it of ſtimulating the uterus in females. Such an antaphrodiſiac power ſeems improbable to me; becauſe I knew an inſtance of a man who almoſt every day eat many leaves of freſh mint with his bread and butter, but never found from thence any diminution of his venereal appetites; and I have reaſon to believe that his report was true.

MENTHA PIPERITA.

THIS plant contains as much or more eſſential oil than any other ſpecies of mint, and is of a more acrid taſte, with a ſingular feeling of a cold air, immediately ſucceeding the chewing or ſwallowing of it. There is no doubt of its anſwering the purpoſes of any other ſpecies of mint; and the water diſtilled from it is manifeſtly more immediately antiſpaſmodic and carminative. The ſame effects are readily obtained by its oil made into an Eleo ſaccharum, and diffuſed in water. Its qualities are, with great probability, aſcribed to the camphire, which the experiments of GAUBIUS ſhow to be largely contained in it. The rectification which we have mentioned on the ſubject of lavender, as proper for improving the moſt part of eſſential oils, is particularly neceſſary and proper for this of peppermint. What has been called the Eſſence of Peppermint, ſeems to me to be no other than the rectified oil diſſolved in ſpirit of wine.

PULEGIUM.

THIS is a ſpecies of mint, and has ſo much the common properties of the genus, that, in my opinion, nothing but the neglect of all attempt to eſtabliſh principles could have made phyſicians think of this as a peculiar medicine, different from the other ſpecies. It does not contain more eſſential oil than the mentha ſativa, and does not diſcover any of the camphire that is found in the peppermint. It is upon this account that I cannot find any foundation for its peculiar virtues. It has, nevertheleſs, been conſidered as an antiſpaſmodic, and of particular uſe in the chincough: but in many trials of it I have not found it of any ſervice; and, on the contrary, like every other heating medicine, have found it hurtful.

ANOTHER uſe of it as an antiſpaſmodic has been commonly aſſerted; which is, its aſſiſting the menſtrual evacuations of the female ſex: This, however, I believe to be on no better foundation. At the time of menſtruation, the ſex are often affected with dyſpeptic and ſpaſmodic ſymptoms in the ſtomach, and I have known theſe ſymptoms relieved by an infuſion of the pulegium, or, as it is commonly called, pennyroyal tea; but the ſame relief was obtained more certainly by the uſe of the peppermint or the mentha criſpa, though in none of them any ſpecific power can be perceived. They have been often tried in the caſes of ſuppreſſed menſes without any benefit at all.

IT does not appear to me to be with any diſcernment when Dr HALLER tells us, that the pulegium, along with ſteel, is an infallible emmenagogue; as it is preſumed that, with the ſame aſſiſtance, he might have found many other plants equally powerful. It is not indeed to be doubted, that the ſeveral ſpecies of mint may, as general ſtimulants of the nervous ſyſtem, be uſeful in retentions of the menſes; but the account given us by Linnæus of mints producing an uterine hæmorrhagy, has probably been owing to a fallacia cauſæ.

ROSMARINUS.

IN this plant there is much eſſential oil of a very fragrant kind; and it has therefore always juſtly had the reputation of a cephalic, or as a medicine that gently ſtimulates the nervous *ſyſtem, but hardly ſo ſtrongly as to affect the ſanguiferous. It is* to be remarked here, that theſe qualities are not to be found in the petala of the flowers, and only in their calices, or in the leaves of the plant, eſpecially thoſe at the extremities of the branches. It is indeed further to be remarked here, that the eſſential oil of the verticillated plants is commonly to be found more copiouſly in the calices of the flowers than in their other parts. The eſſential oil of roſemary ariſes copiouſly in diſtillation with ſpirit; and it is thus that the celebrated aqua reginæ Hungariæ, or Hungary water, is prepared. It is not made ſo perfect from roſemary growing in this climate, as in that growing in a more ſouthern. It ſeems to me that our diſpenſatories have judged ill in preſcribing the ſpiritus roſmarini and ſpiritus lavendulæ to be made from recent plants, as all the odorous verticillatæ are improved by ſome drying, and give out a greater proportion of eſſential oil.

SALVIA.

THIS has been a celebrated plant; and as it contains a quantity of eſſential oil, though not of the moſt fragrant kind, it may be allowed to have the virtues of the other plants of this order. It has been frequently employed, eſpecially in Britain, as a tea; but it is ridiculous to allege, as ſome German writers have done, that it may be employed as a tea in place of that brought from China; from which, in its qualities, it is entirely different. From particular experience I can aſſert, that though it has not the virtues, neither has it the noxious qualities, with reſpect to the ſtomach, which the green tea of the Chineſe ſo frequently has. What, however, are the particular virtues of ſage, I am a little uncertain. Though it were true that the Chineſe put a greater value upon ſage than upon their own tea, it would not give me any high opinion of its peculiar virtues.

It has been obſerved before, that popular opinions are not always well founded; and in this, and ſome other inſtances, the Chineſe do not ſeem to be wiſer than other people.

SAGE, eſpecially in Britain, has been much employed as a ſudorific, but, ſo far as can be perceived, with no advantage above the other aromatics of the ſame order. Many of theſe employed in infuſion, and thrown in warm, in pretty large quantity, while the body is covered up very cloſe, will all equally anſwer the purpoſe of bringing out ſweat. It may however be remarked, that this method has no advantage above others that may be employed; and in ſome inſtances it has been found hurtful, by ſtimulating and heating too much.

IF ſweating is to be employed for preventing the recurrence of the paroxyſms of intermittent fevers, ſage or other verticillated plants may be ſufficiently effectual. But while we thus take notice of the ſage as a ſudorific, we muſt obſerve that it has alſo been employed for reſtraining improper ſweats. For this purpoſe SYDENHAM employed Malaga wine, but VAN SWIETEN found ſage infuſed in wine or ſpirits to be a more effectual remedy. Whether the wine or ſpirits of VAN SWIETEN without ſage would anſwer the purpoſe as it had done with SYDENHAM, I have not experience to determine. The matter, however, is rendered doubtful, as VAN SWIETEN has found the ſage uſeful in reſtraining another immoderate evacuation. The learned Baron had found it uſeful in reſtraining the improper continuing of a flow of milk from the breaſts of women who had been nurſes, after they had weaned their child; but of this I have not any proper experience. It would ſeem, however, to be ſupported by the analogy with mint which has been ſaid to have the power of diminiſhing the ſecretion of milk both in women and in cows.

THE power of ſage in reſiſting putrefaction, which it has in common with mint, and other verticillated plants, may perhaps be ſuppoſed to be owing to camphire, or ſomewhat analogous to camphire, in the compoſition of their oils.

TEUCRIUM.

SEVERAL ſpecies of this genus have entered the catalogues of the materia medica: but ſeveral of them, as having their virtues depending more upon their bitter than upon their eſſential oil, we have mentioned above among the tonics; ſuch as the *Teucrium Scordium*, *Teucrium Chamœdrye*, and *Teucrium Chamæpytis*; and there remains only to be mentioned here among the ſtimulants, commonly named Cephalics, the TEUCRIUM MARUM. This contains a large portion of eſſential oil, of a volatile and camphorated kind. By this, its odour is more pungent than moſt others of the verticillated plants, and has therefore, like many others of this order, an errhine quality, and that the moſt powerful.

ALTHOUGH this plant has not performed all the wonders which LINNÆUS reports of it, it may be allowed to be amongſt the moſt powerful cephalic and antiſpaſmodic of the verticillated plants; and it is to be regretted that it can neither be eaſily cultivated in this country, nor be imported from abroad in a very perfect ſtate.

MARUBIUM.

THIS is a plant which affords little eſſential oil, and that with very little of the fragrance common to the other verticillatæ; for it is more remarkable as a bitter and ſomewhat acrid ſubſtance. It has had the reputation of a pectoral: but in many trials, its virtues in that way have not been obſerved; and in ſeveral caſes it has been judged hurtful. For its uſe in aſthma and phthiſis, and for its power in reſolving indurations of the liver, I conſider the authorities of FORRESTUS, ZACUTUS LUSITANUS, and CHOMEL, to be very inſufficient; and the events they have aſcribed to it ſeem to be very improbable.

B. UMBELLATÆ.

HERE is a ſet of plants, of which many with their botanical affinity have very ſimilar virtues; but the analogy is not complete, as ſome of the umbellatæ have virtues very different from others of the ſame order. It is however alleged, that if the umbellatæ are further diſtinguiſhed, according to the ſoil they grow in, an analogy will ſtill hold ſo far, that thoſe growing in a dry ſoil are ſtimulant and ſomewhat aromatic; whilſt thoſe growing in wet and marſhy places are ſedative and poiſonous plants. This is generally true; although there are ſome exceptions to it. The conium maculatum, and perhaps ſome others of the poiſonous umbellatæ, generally grow in very dry ſoils; whilſt the petroſelinum, naturally growing in wet ſoils, is a ſalutary plant.

THE analogy therefore from the ſoil is not complete; and without experiment is not to be entirely truſted: but as it is generally well founded, I ſhall here make uſe of it, and in this place treat only of the ſimply ſtimulant and ſomewhat aromatic umbellatæ, reſerving the conſideration of the ſedative kind for their proper place in the next chapter.

AMMI.

THESE ſtill retain a place in the London Diſpenſatory; and from the account of their qualities might deſerve it: but as an exotic that we cannot eaſily have in a perfect ſtate, it has been long neglected by us, and perhaps juſtly; as probably its place may be ſupplied by others which we can more eaſily obtain.

ANETHUM.

I should have remarked before, that the virtues of the umbellatæ are chiefly found in their ſeeds, as containing a large portion of eſſential oil. Their virtues are for the moſt part antiſpaſmodic and carminative in the primæ viæ; and what virtues they have, when carried further into the ſyſtem, are not well aſcertained, as we ſhall obſerve more particularly when we come to ſpeak of the particular ſeeds or roots to which theſe virtues are aſcribed.

The ſeeds of Dill have the common virtues of the order, and the waters diſtilled from them have been much employed in the colics of children by the nurſes of England; but it is preſumed that more agreeable carminatives can be found; and accordingly it was formerly omitted in our Scottiſh Diſpenſatory. It was only brought into it again upon the recommendation of the late Sir John Pringle, for the ſake of ſome conformity with the Engliſh practice; but neither our phyſicians nor nurſes have yet conformed to it.

ANISUM.

The ſeeds of this plant contain a large proportion of eſſential oil, which gives the ſeeds their grateful odour. Its taſte is much leſs acrid than the oils of the verticillated plants; ſome of which, therefore, are perhaps more powerfully carminative: but for the ſame reaſon, the oils of the umbellatæ, and particularly of the aniſe-ſeed, are ſafer, and which made into an Eleo ſaccharum,

charum, the moſt convenient form of exhibiting it, may be given pretty largely.

THE aniſe-ſeed and their oil, as well as ſome others of the umbellatæ, have been alleged to be uſeful as promoting expectoration in ſome diſeaſes of the breaſt; but their effects have never appeared to me to be conſiderable.

ANOTHER effect of the aniſe and other ſeeds a-kin to them, has been alleged to be the increaſe of the milk of nurſes; and if it be commonly true, as alleged by Mr GEOFFROY, that the odour appears in the milk, the effect is not improbable; but I have had no experience of it.

TOWARDS the end of the ſixteenth century we had a new medicine introduced, under the title of the Aniſum Stellatum; but it has not yet obtained a place in the liſts of the Britiſh Diſpenſatories, although it has been received by the Ruſſian, Swediſh, and Daniſh. Though of a very different order of plants, the capſule of the ſeeds, in odour and taſte, very exactly reſemble the common aniſe, but are ſomewhatt ſtronger. Theſe capſules ſo far as yet tried, as they have the qualities, ſo they are ſaid to have the virtues of the common aniſe-ſeeds; but as even theſe are not in high requeſt, we ſhall hardly think of introducing an exotic for the ſake of all the difference of ſtrength and quality that may be found in it.

CARUM.

THE ſeeds of this are to moſt perſons more agreeable than thoſe of the umbellatæ uſually employed. They contain a large proportion of eſſential oil; and except in ſome peculiarity of odour, neither the ſeeds nor their oil differ in their virtues from thoſe of aniſe.

FOENICULUM.

THIS has the ſame qualities as the dill, aniſe, and caraway, but in a weaker degree; and therefore, unleſs it be for its odour, which to many perſons is more agreeable than that of the others, it would hardly have a place in medicine.

WE make a diſtinction between the *fœniculum dulce* and *fœniculum vulgare*, which however are only varieties of the ſame ſpecies: but as the fennel growing in this country does not produce perfect ſeeds, we mean by the fœniculum dulce, ſeeds imported from a ſouthern climate, we allow, however, the roots to be taken, as they moſt conveniently may, from the plants growing in our own gardens. To both the ſeeds and roots a diuretic and pectoral virtue has been aſcribed; but in many trials I have never found them anſwer theſe purpoſes.

CORIANDRUM.

THE leaves and ſeeds of this plant ſeem to differ very much: The qualities of the former are not ſo well aſcertained as to allow me to ſay any thing about them, and I am therefore to ſpeak only of the ſeeds. Theſe have the common qualities of the other carminative ſeeds we have been ſpeaking of, and when well dried are generally very agreeable. One particular uſe of them is, that infuſed along with ſenna, they more powerfully correct the odour and taſte of this than any other aromatic that I have employed; and are, I believe, equally powerful in obviating the griping that ſenna is very ready to produce.

CUMINUM.

THE ſeeds of this contain a large proportion of eſſential oil, and are therefore powerful carminatives, perhaps more ſo than moſt of the others in uſe; but on account of their more diſagreeable flavour are more rarely employed.

As I formerly obſerved, that the oils of the verticillated plants might be employed in fomentations for diſcuſſing indolent tumours; ſo it is probable that many of the umbellatæ may be employed for the ſame purpoſe, and particularly in this the cummin has been ſuppoſed uſeful.

PETROSELINUM.

THE ſeeds of this ſtill hold a place in the London Diſpenſatory, and have indeed the qualities of the other carminative ſeeds, but not in ſo powerful a degree as many others, and therefore are neglected in the Scottiſh practice.

THE roots ſtill retain their place in our diſpenſatory, and are ſuppoſed to be diuretic; but in their decoctions, which I have often tried, I have not found ſuch a virtue, and poſſibly becauſe their active parts are diſſipated by boiling.

THE herb, as every body knows, is much uſed at table, and therefore muſt be ſuppoſed to be in general ſalutary; but ſingular accounts are given of its effects by materia medica writers, and I dare not contradict them, becauſe I know that in conſequence of idioſyncraſy, the effects are very different in different perſons. With Profeſſor MURRAY the odour is ſaid to be *ingratus*; with BERGIUS it is *fragrans gratus*. To me both the odour and taſte have been always very diſagreeable, though now, in my old age, they are much leſs diſagreeable than they were formerly.

PETROSELINUM MACEDONICUM.

THIS is not retained in the liſts of the Britiſh diſpenſatories, and I know of no peculiar virtues to be aſcribed to it; but of late there have been reports of its ſingular powers in ſome caſes of the venereal diſeaſe, of which I have had no experience, and muſt therefore leave to a further time to be properly aſcertained.

WE have thus mentioned the umbellatæ which are for medicinal virtues chiefly employed in their ſeeds; and we proceed next to thoſe which are chiefly employed in their roots; as

ANGELICA.

ALL the parts of this plant are more or leſs aromatic; but this quality is more conſiderable in the root than in any other part. It is a root gratefully aromatic; and as poſſeſſing all the qualities of the carminative ſeeds already mentioned, may be employed for the ſame purpoſe with theſe: but that it has any peculiar virtues with reſpect to any particular diſeaſe, I cannot perceive, nor can I truſt much to the judgment of the Laplanders on this ſubject

PIMPINELLA.

THIS is a plant in whoſe favour STAHL and his followers were very much prejudiced. In its root and ſeed it has the common qualities of the umbellatæ already treated of: but theſe qualities in the pimpinella are in no high degree; and neither its ſenſible qualities nor any analyſis can make us think of it as a medicine of any value. Dr STAHL was valuable for his ſtudy of the phenomena of diſeaſes; but neither he nor his followers have ſhown any judgment in the choice of remedies. Their ſyſtem gave them a prejudice againſt ſome of the moſt powerful; and thoſe they adopted were feeble and often ſuperſtitious.

GINSENG.

THIS perhaps does not belong to the umbellatæ; but from the doubts that have been raiſed how far it differs from an umbelliferous plant, the Sion Ninſi, to which the ſame virtues have been aſcribed, I have ſet it down here. A root under this name, both from China and North America, has now for many years been well known in our ſhops. It is a very mild aromatic, with ſome ſweetneſs; but theſe qualities are ſo weak, that nothing but a popular notion among the Chineſe, and the great price put upon it by them, would ever have engaged our attention to it as a medicine. We are told that the Chineſe conſider it as a powerful aphrodiſiac; but I have long neglected the authority of popular opinions, and this is one inſtance that has confirmed my judgment. I have known a gentleman a little advanced in life, who chewed a quantity of this root every day for ſeveral years, but who acknowledged that he never found his venereal faculties in the leaſt improved by it.

C. SILIQUOSÆ.

THESE are a ſet of medicines which, with a botanical affinity, have very exactly the ſame medical virtues, and are only different by the degree in which they poſſeſs the ſame power. They have a pungent odour depending upon an eſſential oil, which they give out in diſtillation with water, of the ſame odour with the entire ſubſtance; and notwithſtanding the ſeeming volatility of it, this oil, like that of the aromatics above mentioned, ſinks in water. The pungent odour of theſe ſubſtances has given occaſion to the ſuppoſition of their containing a volatile alkali: and ſuch indeed by a certain management can be obtained from them; but manifeſtly it is not in a ſeparate ſtate in their ſubſtance as they are produced by nature. The diſtilled water of ſcurvy-graſs does not efferveſce with acids, either of the foſſil or vegetable kind; does not precipitate earths diſſolved in acids, nor produce any change in the ſolution of corroſive ſublimate.

It is ſufficiently evident that both the odour and taſte of theſe plants depends upon the oil above mentioned, which is extracted from them by ſpirit of wine; and when carried over with this in diſtillation, affords a very volatile and acrid ſubſtance of the odour and taſte of the plant, leaving behind a maſs entirely deprived of both.

The acrimony of theſe plants is diffuſed over all their parts: from the leaves it readily paſſes off by drying or boiling; from the roots alſo, if minutely broke down, it may be diſſipated by the ſame means. In their ſeeds it is much longer retained; and in both the ſeeds and roots it is more acrid, and in greater proportion than in the other parts of their ſubſtance.

The parts of theſe plants which hold a large portion of active matter, if applied to the ſkin, ſoon excite a redneſs in it; and in conſequence of a continued application, the redneſs which firſt appears ariſes by degrees to a very conſiderable inflammation, and at length to excite bliſters. Theſe continuing for ſome days after to diſcharge a quantity of ſerum, ſhows the ſkin ſtill affected with an inflammation, which for ſeveral days continues to exude an almoſt purulent ſubſtance; and ſuch inflammation and exudation are much later in healing than the like inflammation produced by the application of cantharides.

THE ſame acrid ſubſtance of the ſiliquoſæ, taken internally, gives a powerful and diffuſible ſtimulus, which acts ſtrongly on the nervous ſyſtem; and in larger doſes, or frequently repeated, it acts alſo on the ſanguiferous: but its effects in either way are not durable, as the matter paſſes readily to the urinary paſſages; and increaſing the ſecretion there, it is quickly and entirely diſcharged with the urine, and probably at the ſame time by inſenſible perſpiration.

THE plants of this claſs, when their vegetation, from any cauſe, ceaſes, readily run into putrefaction; and in this ſtate, diſtilled, they give out a volatile alkali.

IT is this circumſtance that has given occaſion to their being called Alkaleſcent Plants, and has given occaſion to ſome miſtakes concerning their nature and uſe; but we now know that their fermentation may be directed to be of the aceſcent kind: and there is hardly any doubt, that, with their diuretic quality, it is their aceſcent nature that renders them ſo powerful, both in obviating and curing the ſcurvy. Their uſe in this reſpect has been long known and univerſally acknowledged; and it has been remarked as a bountiful adminiſtration of nature, that has provided an abundance of theſe plants, eſpecially in thoſe parts of the globe in which the ſcurvy more eſpecially pre-

IN confirmation of our doctrine concerning the aceſcency of theſe plants, it is to be obſerved, that thoſe ſpecies which do not abound in the acrid matter peculiar to the order, but which at the ſame time are very ſucculent, that ſuch abound in a ſaccharine matter, which renders them conſiderably nouriſhing, and fitted to become a large part of the animal fluids. It is equally a conſequence of this ſaccharine matter, that the ſame plants may be readily directed to an acetous fermentation; and when preſerved in this ſtate, they prove a very effectual means both of obviating and of curing ſcurvy.

THESE are the general properties of the ſiliquoſæ: and the genera and ſpecies comprehended under this order have ſo much the ſame common qualities already mentioned, that it is hardly neceſſary to take notice of the particulars. I ſhall only make ſome remarks upon the few which are in moſt frequent uſe, and ſeem to be of moſt conſiderable power.

COCHLEARIA.

THIS is the plant that has been moſt frequently employed in the cure of ſcurvy, and has the reputation of being the moſt effectual. Its ſenſible qualities being as great, if not greater, than any other of this order, are ſufficient vouchers of this. The entire herb has often been employed, and eaten freſh as a ſallad; and it has been made into a conſerve with three times its weight of ſugar: but the virtues are not well preſerved in this way. The moſt common practice is to employ the expreſſed juice; and this plant makes a chief part of the ſucci adſcorbuticos both of the London and Edinburgh Diſpenſatories, which afford a very uſeful medicine.

IT formerly was an ingredient in the aqua raphani compoſita of the Edinburgh Diſpenſatory, and ſtill ſtands in that of the London; but the Edinburgh College being of opinion that the whole of its virtues are not extracted by diſtillation, they have now omitted that diſagreeable preparation. Several foreign diſpenſatories have ordered it to be treated by diſtillation with ſpirit of wine, and have thereby obtained a volatile poignant ſpirit, that may prove an uſeful ſtimulus in ſeveral caſes. It may poſſibly be improved by a combination with the volatile acid of tartar, as in the ſpiritus antiſcorbuticus *Drawitzii*, and in this ſtate may be an uſeful ſtimulant in paralytic caſes. It may alſo be employed as a diuretic, and in this way alſo be uſeful in ſcurvy; but its antiſcorbutic virtues in this ſtate are not to be depended upon, and are far ſhort of the virtues of the plant in ſubſtance.

NASTURTIUM AQUATICUM.

THIS has the common powers of the ſiliquoſæ in a conſiderable degree; and as more ſucculent than many others, and to be obtained more early in the ſpring ſeaſon, it has been the moſt frequently employed with the cochlearia to give the ſucci adſcorbuticos, which have ſo long ſtood in our diſpenſatories. Along with theſe, it has been common to join the becabunga; but as this has none of the qualities of the ſiliquoſæ, and has no other than that of a ſimple vegetable juice, the Edinburgh College have left it out in the laſt edition of their diſpenſatory. It has been always the practice to join with the juices of the ſiliquoſæ a quantity of a native acid juice, formerly that of the acetoſa; and, for the uſe of the poor, the practice might ſtill be continued with advantage: but the diſpenſatories have properly enough preſcribed the juice of Seville oranges.

THE addition of acids to the juices of the plantæ ſiliquoſæ, ſhows ſufficiently that the latter do not operate as alkaline or alkaleſcent ſubſtances; and I am perſuaded that the addition of acids renders the juices more certainly effectual, by determining them more certainly to an aceſcent fermentation. It is hardly neceſſary to obſerve, that as the volatile parts are ſo readily exhaled in being expoſed to the air, that the ſucci adſcorbuticos, when intended to be preſerved for any time, ſhould be kept in cloſe ſtopped veſſels.

Cardamini.

The ſenſible qualities of this plant, and particularly of its flowers, are ſo far inferior to thoſe of ſeveral others of the ſiliquoſæ, that I ſhould not have thought of taking notice of them as ſubjects of the materia medica; but, upon the reſpectable authority of Sir George Baker, I think it my duty to inform my readers, that the flowers of this plant have been found to be very effectual remedies in various ſpaſmodic affections; and for further information muſt refer my readers to the Medical Tranſactions, Vol. I. art. 19.

Erysimum.

Several ſpecies of this genus have been taken notice of by materia medica writers; but I am to ſpeak only of the eryſimum officinale, and of this, not for the general qualities of the ſiliquoſæ, which it does not poſſeſs in any conſiderable degree, but for a particular purpoſe to which it has been eſpecially applied, which is the cure of hoarſeneſs. It is in common to almoſt all the ſiliquoſe plants, that in being ſwallowed, they ſtimulate the mucous glands of the fauces, and thereby excite a more copious excretion of mucus. When hoarſeneſs therefore depends, as it often does, upon the interrupted ſecretion of this fluid, it is obvious that the ſtimulus we ſpeak of may be uſeful. For this purpoſe, it has been common to employ the Eryſimum; which, however, has been generally preſcribed in an injudicious manner, along with many other things of no meaning;

ing; and the moſt ſimple form, of merely the juice of the eryſimum, with an equal part of honey or ſugar, is certainly the moſt proper.

IF the eryſimum in this buſineſs has any advantage over the other plants of the order, it ſeems to me to be its having leſs acrimony than others, which allows it to be more freely and frequently uſed. When the eryſimum was not at hand, I have found that the ſyrup of horſe-radiſh would ſupply its place; but this ſyrup muſt be made very weak, otherwiſe it cannot be frequently uſed or long continued, without rendering the fauces ſore and uneaſy. I have found that one dram of the root, freſh, ſcraped down, was enough for four ounces of boiling water, to be infuſed in a cloſe veſſel for two hours, and made into a ſyrup with double its weight of ſugar. A tea-ſpoonful or two of this ſyrup, ſwallowed leiſurely, or at leaſt repeated two or three times, we have found often very ſuddenly effectual in relieving hoarſeneſs.

BRASSICA.

THE various ſpecies of this employed in diet I have taken notice of in my Firſt Part. The title is repeated here as a medicinal ſubject; and with this view it is to be obſerved, that the various ſpecies or varieties of this genus differ from almoſt all the other plants of the order, by their poſſeſſing leſs, at leaſt in their leaves, of the acrimony peculiar to it. By this they are better ſuited to the purpoſe of diet; and they are eſpecially fitted to this purpoſe by their greater ſucculency, and by their containing, as above obſerved, a large proportion of ſaccharine matter.

THOUGH they are deficient of that acrimony that ſeems to give peculiar power to the ſiliquoſæ, and as they are called Antiſcorbutic Plants, the braſſica has ſtill very great powers as ſuch; and taken in largely as aliments, they have proved an effectual cure of the diſeaſe. This I aſcribe to their aceſcency; and now it is well known, that if by proper art they are made to undergo an aceſcent fermentation, and can be preſerved in that ſtate, they are a very effectual means, both of obviating and curing ſcurvy. The art of preparing cabbage for this purpoſe, and making what is called *Saur Kraut*, is now ſo well known, and deſcribed in ſo many books, that it is not neceſſary for me to inſert it here.

RAPHANUS RUSTICANUS.

THE root of this only is employed; and it affords one of the moſt acrid ſubſtances of this order, and therefore proves a powerful ſtimulant, whether externally or internally employed. Externally, it readily inflames the ſkin, and proves a rubefacient that may be employed with advantage in palſy and rheumatiſm; and if its application be longer continued, it brings on a bliſtering, with the effect I formerly mentioned.

TAKEN internally, I have ſaid in what manner its ſtimulant power in the fauces may be managed for the cure of hoarſeneſs. Received into the ſtomach, it ſtimulates this, and promotes digeſtion, and therefore is properly employed as a condiment with our animal food. If it be infuſed in water, and a portion of this infuſion be taken with a large draught of warm water, it readily proves emetic, and may either be employed by itſelf to excite vomiting, or to aſſiſt the operation of other emetics.

INFUSED in wine, and taken into the ſtomach, it proves ſtimulant to the nervous ſyſtem, and is thereby uſeful in palſy; and if employed in large quantity, it proves heating to the whole body: and hereby it proves often uſeful in chronic rheumatiſm, whether ariſing from ſcurvy or other cauſes. BERGIUS has given us a particular method of exhibiting this root, which is by cutting it down, without bruiſing, into very ſmall pieces; and theſe, if ſwallowed without chewing, may be taken down in large quantity, to that of a table-ſpoonful: and the author alleges, that in this way, taken every morning, for a month together, this root has been extremely uſeful in arthritic caſes; which, however, I ſuppoſe to have been of the rheumatic kind.

IT would ſeem, that in this manner employed, analogous to the uſe of unbruiſed muſtard-ſeed, it gives out in the ſtomach its ſubtle volatile parts, that ſtimulate conſiderably without inflaming. The matter of horſe-radiſh, like the ſame matter of the other ſiliquoſe plants, carried into the blood-veſſels, paſſes readily to the kidneys, and proves a powerful diuretic, and is therefore uſeful in dropſy; and we need not ſay, that in this manner, by promoting both urine and perſpiration, it has been long known as one of the moſt powerful antiſcorbutics.

SINAPI.

THE ſeeds of this are the part only employed; and it has been common for the purpoſe of medicine to diſtinguiſh two kinds of it, the Sinapis Nigra and the Sinapis Alba; which though they ſeem to be of different ſpecies, hardly differ in their ſenſible qualities, and for every purpoſe may be indifferently uſed.

THIS ſeed contains a volatile part very pungent to the ſmell and taſte. Treated by diſtillation with water, it gives out an eſſential oil which diſcovers the ſame acrimony that is found in the whole ſubſtance, and ſhows that the acrimony of this depends upon that. The ſame ſubſtance contains alſo a portion of mild oil, which may be obtained by expreſſion from the powdered ſeed; and when this is done, the acrid and active parts are found in the paſte that remains after the expreſſion of the mild oil.

IN theſe ſeeds there is a large portion of farinaceous matter, capable of fermentation, under which the volatile oil is more evolved, and ſhows its activity more readily: Hence it is that the freſh powder ſhows little pungency, and a good deal of bitterneſs; whereas, when it has been moiſtened with vinegar, and ſet by for a day, it becomes conſiderably more acrid, as is well known to thoſe who prepare muſtard for the uſe of the table. This applies alſo particularly to its external uſe. Muſtard, any how moiſtened and applied to the ſkin, will become in time rubefacient and bliſtering; but as prepared for the table, it is more immediately active than the freſh powder; and therefore we have done improperly in ordering the freſh powdered muſtard in our ſinapiſms, as the table-muſtard would be much more quickly effectual.

MUSTARD thus applied externally has all the powers of the horſe-radiſh mentioned in the laſt article; and I am much ſurpriſed that the learned Profeſſor MURRAY ſhould aſſert, that muſtard ſtimulates the ſyſtem leſs than the ordinary veſicatories; that is, as I ſuppoſe, than cantharides: but to me the buſineſs ſeems quite otherwiſe. Muſtard, in its powdered ſtate, taken internally, has all the powers and effects of the other ſiliquoſæ; but they are here more active and powerful than in almoſt any other, except it may be the raphanus ruſticanus laſt treated of.

A practice, ſo far as I can learn, firſt begun in this city about fifty years ago, has been ſince very frequent. It conſiſts in giving the muſtard-ſeed entire and unbruiſed, to the quantity of half an ounce, or as much as an ordinary table-ſpoon will contain. This does not prove heating in the ſtomach; but ſtimulates the inteſtinal canal, and commonly proves laxative, or at leaſt ſupports the uſual daily excretion. It commonly alſo increaſes the ſecretion of urine; but in this I have found it frequently to fail. In giving it twice a-day, as our common practice is, I have not found it to ſtimulate the ſyſtem or heat the body; but it muſt certainly have that effect if it anſwers in the Swediſh practice, by giving it four or five times a-day to prevent the recurrence of intermittent fevers.

I TRUST very readily to the teſtimony of BERGIUS, when he tells us that he has in this way often cured vernal intermittents; and the more readily, when his candour acknowledges that it is not ſufficient for curing autumnal quartans. It will be more readily underſtood, that the bruiſed ſeed, taken in large quantity along with ſome ardent ſpirits, may not only be more powerful for this purpoſe; but alſo, that ſuch doſes may ſtimulate too much; and, as VAN SWIETEN informs us, may induce a violent fever.

BERGIUS ſays, that in protracted and frequently recurring intermittent fevers, he had joined powdered muſtard with the Peruvian bark with a good effect. He obſerves, that under this management, his patients had frequently felt a heat at their ſtomach, but it was without any harm.

I CANNOT finiſh this ſubject without obſerving two very different opinions with reſpect to it. Profeſſor MURRAY ſays, that muſtard gives an agreeable ſenſation in the ſtomach, and gives in him a cheerfulneſs to the mind: "Ita adjuvat cibi "concoctionem, ventriculo ſenſum gratum impertit, mentique "certe in memet hilaritatem haud mediocrem, forſitan ex aere "fixo quod extricatur, conciliat." LINNÆUS gives a very contrary opinion: "Nimius uſus (ſays he) cauſatur languorem et "tollit lætitiam." I cannot vouch for the truth of either opinion.

D. ALLIACEÆ.

THE plants to be taken notice of under this title are all of them ſpecies of the ſame genus; and though there are plants of other genera which have the odour peculiar to this, and may perhaps have ſomewhat of its qualities, they have not ſo much of it as to deſerve being taken notice of here.

OF the ſpecies of allium, ſeveral may be treated of as of very ſimilar virtue: but theſe virtues are moſt conſiderable in the Allium Sativum of LINNÆUS; and therefore we are to treat of this in the firſt place, under the title of Garlic.

ALLIUM SATIVUM.

THE whole of the plant has ſomewhat of the ſame qualities; but it is the root only that is employed in medicine. This is of a ſtrong pungent odour, and of a very acrid taſte. Theſe qualities depend upon a very volatile part, which is readily diſſipated by drying, if the roots be bruiſed and the interior parts be expoſed to the air, or by boiling in water. This volatile ſubſtance is at leaſt in part an eſſential oil, which may be obtained by diſtillation in the ordinary manner; and, like the oils of many of the ſiliquoſæ, ſinks in water. In all theſe reſpects, the alliaceæ are ſimilar to the ſiliquoſæ, as they are alſo in virtue, although ſtill with ſome little difference in their chemical qualities.

THE alliaceæ are not ſo entirely extracted by ſpirit of wine as the ſiliquoſæ; and though the former are in part extracted, they are not carried over with the ſpirit in diſtillation as the latter are. Though the qualities of the alliaceæ are not ſo readily diſſipated by drying as thoſe of the ſiliquoſæ are; yet they always, by any drying, ſuffer ſome diminution of their virtue; and by urging the drying further, it may be diſſipated entirely. In my opinion, Dr LEWIS improperly propoſes the dried garlic to be uſed in any proportion as a medicine.

THE medicinal qualities of garlic are very conſiderable; and I take notice of them firſt as they are externally applied. Garlic bruiſed and applied to the ſkin readily inflames it; and applied for ſome time will raiſe a bliſter, as we have ſaid of muſtard and horſe-radiſh: but the effects of the bliſtering are not ſo permanent nor ſo ſlow in healing from the garlic as from the ſiliquoſæ. It may however be a queſtion, Whether the very diffuſible nature of the garlic may not in ſome caſes give a more immediate and conſiderable ſtimulus to the whole ſyſtem than the ſiliquous ſubſtances do?

GARLIC, taken into the ſtomach, ſeems to ſtimulate this organ and favour digeſtion, and may therefore be conſidered as an uſeful condiment of our food; but both its odour and taſte are ſo diſagreeable to many perſons, that in many caſes they are inadmiſſible: but as in warm climates it is ſaid to be much milder both in ſmell and taſte, it may in theſe be more frequently and largely employed.

EVEN in its moſt acrid ſtate, it is admitted into many of our ſauces in ſmall proportion. Its diffuſible odour is very readily and largely communicated to the air of the ſtomach; and therefore affects not only the eructations, but even the ordinary exhalations, pretty conſtantly ariſing from that organ. It is thereby often diſagreeable to the perſons who have eaten it, and more ſo ſtill to byſtanders; but all this may be ſomewhat corrected by ſome volatile aromatics which have been at the ſame time taken in.

THE ſtimulus of garlic taken into the ſtomach is readily communicated to the reſt of the ſyſtem, and is certainly heating and inflammatory to the whole. In all caſes, therefore, in which a phlogiſtic diatheſis, or other irritability, already prevails, large doſes of it may be very hurtful. It is probable, that from inſtances of its improper uſe, ſome authors, imbued themſelves with the ſtrongeſt prejudices againſt it, have given us too ſtrong aſſertions of its general baneful qualities; and on the other hand, many, under no ſuch prejudices, have celebrated garlic as one of the moſt uſeful medicines.

ITS ſtimulus is more readily and quickly diffuſed over the ſyſtem than that of almoſt any other ſubſtance known. It not only affects the perſpiration and ſecretion of urine, but ſeems to pervade every veſſel of the ſyſtem: and BENNET's account of its effects appearing ſo ſuddenly in iſſues, is a ſtrong proof of this. By its ſtimulus being thus diffuſible and powerful, it certainly may be uſeful in many diſeaſes; as, wherever there is a languor of the circulation in any part, or wherever there are interrupted ſecretions. Accordingly, its diaphoretic and diuretic powers have been often uſeful in dropſy. Dr SYDENHAM found ſome dropſies cured by garlic alone.

FROM what we know of ſome of the other ſpecies of this genus, there can be no doubt of the allium ſativum being a remedy for the ſcurvy.

As taken in any manner, and even as externally applied, it ſo readily appears in the vapour ariſing from the lungs, there can be no doubt of its promoting the ſecretions, and therefore the exhalations, from that organ. Its uſe, therefore, in pituitous aſthma, and even in ſpaſmodic aſthma requiring expectoration, will be readily admitted; and I am ready to allow what has been aſſerted, that even in its external application to the ſoles of the feet, it has been uſeful in thoſe diſeaſes.

THE alexipharmic virtues of garlic have been much celebrated; and ſo far as diaphoretic and antiſeptic powers can prove ſuch, garlic has as good pretenſions as many others. Even in the plague, which is ſo commonly attended with a low fever, it is probable enough that it may have been uſeful: but the virtues which have been aſcribed to it, of obviating and reſiſting contagion, appear to me extremely doubtful.

THE ſtimulant powers of garlic, like that of many other ſubſtances already mentioned, may be employed for preventing the recurrence of intermittent fevers; and BERGIUS tell us, that he has ſeen even quartans cured by it. He gives us a particular manner of uſing it in the following paragraph: "Incipiendum "a bulbulo unico mane et veſperi, ſed quotidie unus bulbulus "ſuper addendus, uſquedum 4 vel 5 bulbulos ſumſerit æger "qualibet vice. Si febris tunc evanuit, diminuenda erit doſis, "et ſufficit poſtea ſumere unicum vel etiam binos bulbulos, "mane et veſperi, per plures ſeptimanas."

THE ſame author takes notice of a particular virtue of garlic in the cure of deafneſs; and I am ready to believe it, as I have myſelf ſeveral times found the juice of onion in ſuch caſes very uſeful. BERGIUS's manner of uſing the garlic it will be proper to give in his own words: "In ſurditate rheumatica ſæpius levamen attulit, lanam bombycinam ſucco allii imbibere, "illamque auri intrudere, repetitis vicibus per diem unicum. "Meatus auditorius inde rubet, dolet et ſenſibilis fit per diem "unum alterumque, tum prurit, tandemque deſquamatur, re-"deunte ſæpe auditu."

GARLIC, as a medicine, is employed in different forms. Sometimes the cloves dipped in oil are ſwallowed entire; and in this way a number of cloves may be taken at the ſame time, without proving warm on the ſtomach, though manifeſtly acting on the ſyſtem as diuretic and otherwiſe. This I take to be the adminiſtration of BERGIUS in the cure of intermittents mentioned above. For perſons who cannot ſwallow the entire cloves, they are cut down without bruiſing into ſmall pieces; and in this way a conſiderable quantity, if ſwallowed without being chewed, may be taken at once, and without proving very warm in the ſtomach, although it be found to be an active medicine. When the garlic cannot, in any of theſe ways, be taken in a ſomewhat entire ſtate, it is to be bruiſed; and, with powders coinciding with the intention of the garlic, the whole is made into pills: but it is not a very proper formula for long keeping, as the active parts of the garlic are readily diſſipated by drying. Theſe active parts are more certainly preſerved by infuſing the bruiſed garlic in warm water, and after a due infuſion making the liquor into a ſyrup or oxymel in the manner of the London Diſpenſatory. In this form the garlic is conſiderably powerful; but cannot be taken in any conſiderable quantity, without irritating the fauces, and even the ſtomach: and in any quantity, in which I could introduce thoſe forms of the medicine, I have been often diſappointed of its diuretic effects.

ALLIUM SCORODO PRASUM

THIS is the ſpecies which in its acrimony comes neareſt to the allium ſativum; but I do not know of its being uſed as a medicine, though it might perhaps be conveniently done, as the bulbs in the flower heads might be ſwallowed more eaſily than the cloves of the allium ſativum.

ALLIUM CEPA.

THIS contains a very volatile part, which however flies off ſo readily upon the ſubſtance being cut into and expoſed to the air, that it cannot be directed to any medicinal purpoſe. What remains when this is diſſipated, has both in ſmell and taſte a great deal of the acrimony of the garlic; but both in ſo much a milder degree, that though there can be no doubt of its ſtimulating the ſtomach ſo much as to prove an uſeful condiment to our food, and though it certainly paſſes both by perſpiration and urine, and therefore may be uſeful, yet it does not ſeem poſſible to find in it an active remedy. Beſides the acrid matter peculiar to the genus, it contains alſo a ſaccharine and mucilaginous ſubſtance; which is a nutritious matter, and may in the whole of its ſubſtance be employed as an uſeful antiſcorbutic. All the ſpecies of allium have been by many writers commended as uſeful in nephritic and calculous caſes; but they do not ſeem to act otherwiſe than as diuretics, the uſe of which, in nephritic and calculous caſes, is in general very doubtful. It does not ſeem neceſſary to mention the uſe of onions externally applied in promoting ſuppuration; for as they are employed in a heated ſtate, they do not ſeem to have more power than that of other mucilaginous poultices. The uſe of their juice in the cure of deafneſs, by a few drops put into the ear at bed-time, I have mentioned above on the ſubject of the allium ſativum.

SOME other ſpecies of allium, as the allium porrum, allium aſcalonicum, allium fiſtuloſum, and allium ſchænopraſum, are employed in diet, but hardly in medicine, as their qualities are in a leſs conſiderable degree than thoſe we have already mentioned. In diet, the allium porrum affords a large quantity of nutritious matter, and the aſcalonicum is conveniently employed as an agreeable condiment, having much leſs of the odour that is diſagreeable in the allium ſativum, or even in the cepa.

E. CONIFERÆ.

OF this order only two genera, the pinus and juniperus, are to be taken notice of here; for though there are many other plants that belong to this as a natural order, they are many of them of very different qualities from thoſe we are to treat of; or if ſome of them have ſomewhat of the ſame qualities, they have them not in ſuch a degree as to intitle them to have a place in the materia medica of Europe.

PINUS.

THIS genus comprehends a great number of ſpecies very much of the ſame qualities; but in what different degrees I cannot exactly determine, and I do not think it neceſſary to attempt it; for it appears to me that the virtues of all of them depend upon the TURPENTINE they contain, and it is properly the virtues of this well-known ſubſtance which we are to treat of here.

THIS indeed again has been conſidered as of different ſpecies;

and it may be allowed that they are different in the degree in which they poſſeſs the general qualities, but I doubt much if this difference is in any caſe ſo conſiderable as to affect the purpoſes of medicine; and I am of opinion that the Edinburgh college have done rightly in taking into the liſt of their materia medica the terebinthina larigna, or as it is commonly called the Veneta, only. And as this is the only kind that has been the ſubject of my obſervation, it is this only I am to be underſtood more ſtrictly to ſpeak of here: but I hope, that what I am to ſay will apply to all the other ſpecies which have been or may be in uſe.

TURPENTINE in its entire ſtate is an acrid ſubſtance, and when applied to the ſkin inflames it to a conſiderable degree. It might perhaps by itſelf be an uſeful rubefacient, but when we would prevent its operation from going too far, it is not eaſy to waſh it off the ſkin. When it was employed in the emplaſtrum volatile of the former editions of the Edinburgh Diſpenſatory, it proved a very powerful rubefacient, more powerful than that of the volatile alkali combined with expreſſed oils.

The only difficulty I have found in the employment of turpentine in this form was, that it often gave more pain than my patients would willingly bear, and that it was neceſſary to take it away before it had the effects in removing the pains of the joints for which it had been applied.

FROM this account of the acrimony of turpentine, it will readily appear that it was, if ever, improperly applied for freſh wounds; and whatever has been ſaid in this reſpect by former writers of the power of this or of other ſubſtances under the name of balſams, very much of the ſame nature, muſt have proceeded upon miſtake. It is true, when wounds or ulcers, from a flaccidity of the parts, do not come to a proper ſuppuration, the ſtimulus of turpentine may be of uſe: but even in that caſe the turpentine or balſams of the ſame nature cannot be properly employed alone, but muſt be diffuſed and involved in ſome ſubſtance that may moderate their acrimony, as in the digeſtive ſo commonly employed by our ſurgeons.

I TAKE it to be an improvement in modern ſurgery, that to freſh wounds, and even to them in their ſuppurating ſtate, no applications but of the mildeſt kind are to be made, and that the application of terebinthinated ſubſtances are not only unneceſſary but may be hurtful.

Theſe are the obſervations I can make on the external uſe of turpentine, but its internal uſe has been alſo very frequent. Upon account of its diſagreeable acrimony in the mouth and fauces, it cannot be eaſily taken by itſelf into the ſtomach, but muſt be accompanied with ſome other matter, as ſugar, honey, or yolk of egg, ſo employed as to ſoften its acrimony, and ſerve to diffuſe it in a liquid, or it may by means of a powder be brought into the form of pills. But however ſoftened or exhibited, it is ready in any large quantity to be warm in the ſtomach, and to give that uneaſineſs or ſickneſs which, as we judge, ariſes from ſubſtances not readily miſcible with the animal fluids.

THERE can be no doubt of its ſtimulating the ſtomach, and communicating from thence a ſtimulus to the whole ſyſtem; but its peculiar effects in this way I have not had occaſion to diſcern.

As it proceeds further in the alimentary canal, it manifeſtly ſtimulates this, and proves more or leſs a laxative, though it can hardly be taken in, in ſuch quantity as to prove remarkably purgative. Its power, however, of ſtimulating the inteſtines appears eſpecially when it is employed in glyſters, when to the quantity of half an ounce or an ounce it is very diligently triturated with yolk of egg, ſo as to be perfectly diffuſed and ſuſpended in a watery liquor, and in this ſtate injected into the rectum; we have found it to be one of the moſt certain laxatives that could be employed in colics and other caſes of obſtinate coſtiveneſs.

WHEN it is carried into the blood-veſſels, it there ſhows its power of ſtimulating the whole ſyſtem; and as ſuch it has been found uſeful in chronic rheumatiſm, and, like ſome other terebinthinate ſtimulants, has been found uſeful in preventing the gout. It ſhows conſtantly a tendency to paſs off by the ſecretion of urine, which it imbues with a peculiar odour, and proves very generally diuretic. At the ſame time it cannot be doubted that it paſſes by perſpiration; and theſe operations explain very well why it has ſo often been found uſeful in the ſcurvy.

As it may be readily admitted, that the ſame medicines which paſs by perſpiration through the ſkin will alſo paſs by the exhalation from the lungs; this will in ſome meaſure explain the virtues that have been aſcribed to the terebinthinate ſubſtances, which come under the title of balſams, in ſome diſeaſes of the breaſt.

HERE, however, is the place to remark, that even from a miſtake, as I judge with reſpect to the uſe of turpentine in wounds and ulcers, and more certainly from a falſe analogy, the uſe of it has been transferred to internal ulcers of all kinds. It is, however, now very generally underſtood, that terebinthinate medicines are not only uſeleſs but commonly very noxious in ſuch caſes. This was firſt pointed out by Dr Boerhave, and after him, without however his being taken notice of, has been ſince inculcated by Dr Fothergil. After both, the argument that may be employed is, that ſuch internal ulcerations are ſo far from needing the inflammatory ſtimulus, by which the balſams are often uſeful in external ulcers, that it is a ſtate of too much inflammation that prevents their ſpontaneous healing.

WITH reſpect to the internal uſe of turpentine, it is proper to remark, that as a diuretic, it has been commended for preventing caluculous concretions in the urinary paſſages, and for carrying off ſuch concretions, whilſt they are in a condition to paſs by the excretories: but from any thing we yet know of the lithogeneſis of the human body, we cannot perceive a foundation for the firſt opinion; and with reſpect to the ſecond, the applying ſuch a ſtimulus is always in danger of being hurtful, and commonly proves ſo.

ANOTHER operation of turpentine in the urinary paſſages is that in the caſe of gleets. The pathology of theſe, however, in different caſes, is not yet ſo well aſcertained as to teach me to adapt a proper remedy to each; but there is a caſe in which I have found the diſeaſe cured by inducing ſome degree of inflammation upon the urethra: and I am perſuaded that turpentine, or what is much the ſame the balſam copaivæ, operates only in this manner; for I have had ſome inſtances both of turpentine and of balſam copaivæ producing a manifeſt inflammation in the urethra to the degree of occaſioning a ſuppreſſion of urine; but at the ſame time, when theſe effects went off, a gleet which had ſubſiſted for ſome time before was entirely cured.

IT appears to have been the analogy with gleets that has led practitioners to employ the terebinthinate medicines in the fluor albus of females; a diſeaſe difficult both with reſpect to theory and practice. Phyſicians have recommended the uſe of theſe medicines in the fluor albus, and I have frequently employed them but ſeldom with ſucceſs; and one hinderance of this has been, that few female ſtomachs can be brought to bear the quantities of the medicine that might be neceſſary.

IT is time now to obſerve, that the whole of the virtues of turpentine we have mentioned depend eſpecially, if not entirely, upon an eſſential oil; which by diſtillation with water may be obtained from it in large quantity, and which is often uſed as a medicine in its ſeparate ſtate. Externally applied, this oil irritates and excites ſome degree of inflammation in the ſkin, but not ſo readily or ſo conſiderably as the entire turpentine. It is, however, an uſeful rubefacient, and ſeems to be as effectual as any of the aromatic oils; and if it was not for its diſagreeable odour, it would be more frequently employed than theſe along with camphire, or otherwiſe.

ITS ſtimulant power externally applied, appears ſufficiently from hence, that anointed on the ſpine it has been found uſeful in intermittent fevers.

TAKEN into the ſtomach, it excites a ſenſe of heat, and an uneaſineſs of the ſame kind as that ariſing from the entire turpentine, and it is equally indigeſtible. Carried further into the inteſtines, it does not diſcover the ſame laxative quality as the entire turpentine.

IT paſſes readily into the blood-veſſels, and there it is commonly determined to the urinary paſſages, and increaſes the ſecretion of urine; but as it cannot be eaſily introduced in large quantity, I have never found it a very uſeful diuretic, and not always a ſafe one, as ſometimes irritating the urinary paſſages too much; and of which we have two remarkable inſtances from Dr STEEDMAN in the Edinburgh Medical Eſſays, Vol. II. art. 5.

IT ſeems to be a very diffuſible ſtimulus, and probably pervades the whole ſyſtem. It ſeems to irritate the extremities of the veſſels every where; and the uſe of it which the Drs PITCAIRN and CHEYNE have propoſed in the ſciatica, is very probable. I have never indeed found any perſon's ſtomach to bear it in the quantity they have propoſed, and therefore I perhaps have been diſappointed of its effects in the entire cure of the diſeaſe; but even in leſſer doſes I have frequently found it an uſeful remedy.

As the pix liquida, or tar, is a matter that, by a particular mode of burning well known, is procured from various trees of the pine kind, it falls to be mentioned here. It is properly an empyreumatic oil of turpentine, and not only retains much of the ſtimulant power of that, but perhaps poſſeſſes alſo ſome others acquired by the burning; ſo that it has been ſuppoſed to have powers analogous to thoſe of turpentine. It is, however, a ſubſtance more diſagreeable to the ſtomach than the turpentine or its oil; and in ſeveral trials of the pilulæ piceæ of the Pharmacopœia Pauperum, I have never found them of any ſpecial uſe.

A MIXTURE of equal parts of tar and mutton-ſuet, or of five parts of tar to two of wax, forms an ointment which ſome have thought of uſe in certain ulcerations; but I have never found that in any caſe it anſwered better than ointments with a more moderate impregnation of turpentine: and the tar ointment applied, as ſome have propoſed, to cancerous ſores, has always appeared to me to be hurtfully irritating.

I HAVE met with an empirical practice with reſpect to tar of a ſingular kind. A leg of mutton is laid to roaſt; and whilſt it continues roaſting, it is baſted with tar inſtead of butter. Whilſt the roaſting goes on, a ſharp ſkewer is frequently thruſt into the ſubſtance of the mutton, to give occaſion to the running out of a gravy; and with the mixture of tar and gravy to be found in the dripping-pan, the body is to be anointed all over for three or four nights ſucceſſively; whilſt for the ſame time the ſame body-linen is to be worn. This is alleged to be a remedy in ſeveral caſes of lepra; and I have had one inſtance of its being employed in a *Lepra ichthyoſis* with great ſucceſs: but for reaſons readily to be apprehended, I have not had opportunities of repeating the practice.

WHEN treating of tar, it might be expected that I ſhould treat of tar-water; but I refer that to another head, under which the virtues of this liquid will be more properly conſidered.

THE virtues aſcribed to tar, of obviating and correcting the contagion of the ſmall-pox do not deſerve any notice. WALLERIUS followed the practice of the vulgar in this affair, and thought it was attended with ſucceſs; but he is ſo candid as to ſay, that whether the effects were to be aſcribed to the uſe of the tar, or to other cauſes, he could not determine.

IN the whole of the above, I have conſidered the properties of turpentine as in common to the whole of the turpentines afforded by the genus of pines; and I have not thought it neceſſary to take notice of the various ſpecies marked by materia medica writers, as proceeding from different kinds of pines, or of thoſe from plants of other genera; as I have ſuppoſed the terebinthina *larigna* to be poſſeſſed of every virtue neceſſary for the purpoſes of medicine. In all this, however, I may perhaps have gone too far; and I muſt own, that ſome of the other turpentines are more grateful in their odour and milder in their taſte; and ſuch in particular is the *Balſamum Canadenſe:* but after all the attention I have been able to beſtow, I have not perceived that it has any peculiar virtues, or in general more power to intitle it to the ſingular eſteem that many ſeem to have conceived for it.

JUNIPERUS.

THIS is the other genus of the coniferæ we are to take notice of; and it is very properly connected with the former, both by its botanical affinity and by its ſimilar virtues. It contains, minutely diffuſed through its whole ſubſtance, an eſſential oil very much the ſame with that of turpentine, only of a more agreeable odour. It is manifeſtly diuretic, and imbues the urine with the ſame violet ſmell that the turpentines do.

WHOEVER attentively conſiders the writers on the materia medica, will, I think, perceive, that all the virtues aſcribed to the different parts of the juniper may be referred to the eſſential oil I have mentioned: and I muſt obſerve, that I have not found it a more powerful diuretic than the oil of turpentine; and though it be of a ſomewhat more agreeable odour, I have hardly found the ſtomach receive it in larger quantity than the other.

THE part of juniper chiefly employed in medicine is the berry; which, eſpecially as produced in ſomewhat warmer climates

mates than ours, contains, diffuſed over their whole ſubſtance, particularly in their ſeeds, the eſſential oil I have mentioned in larger quantity. In the common employment of the juniper berries, unleſs pains are taken, by a ſtrong contuſion, to break theſe ſeeds, the infuſion is an agreeable, but a weak, impregnation; and therefore of very little power as a medicine.

WHEN ſpirit of wine is applied to theſe ſeeds, it extracts the eſſential oil from the huſk, pulp, and bruiſed ſeeds very entirely, and carries them over with it in diſtillation. By this it proves a diuretic, but to my obſervation never a very powerful one; and when largely uſed, proves more hurtful by the menſtruum than uſeful by the diuretic quality of the impregnation. To many perſons, eſpecially after the repeated uſe of it, the proper odour of the juniper berries is ſufficiently agreeable; but to others it muſt be rendered ſo by the addition of ſome other aromatics, as in the aqua juniperi compoſita.

IF juniper berries are treated by decoction in water, as happens to them in diſtillation, and the decoction is afterwards inſpiſſated to the conſiſtence of an extract, it gives what is commonly called the Rob Juniperi. As in the preparation of this, it is commonly directed to avoid bruiſing the ſeeds, ſo a little only of the eſſential oil is extracted; and what is extracted is almoſt entirely diſſipated by the boiling. I have always judged this to be an inert preparation. It is ſweetiſh, and very ſlightly aromatic; but I have never found in it the virtues which HOFFMANN and others have largely aſcribed to it.

I might here mention the Sandaracha and Olibanum as products of the juniper; but as I cannot aſcribe to them any medicinal virtues, I do not think it neceſſary to take any notice of them.

JUNIPERUS SABINA.

THIS we have already mentioned under the title of the Fœtids, and ſhall ſay more of it under the title of Emmenagogues.

F. BALSAMICA.

After the conſideration of turpentine, I ſet down this title, becauſe almoſt the whole of the ſubſtances called Balſams have the form and conſiſtence of turpentine; and ſeem to conſiſt of this for the greater part of their ſubſtance. Accordingly, I think they are of very ſimilar virtues; or how far theſe, in the different ſpecies, are different, I find it difficult to aſcertain.

BALSAMUM COPAIVÆ.

THIS is of a thinner conſiſtence than the Venice turpentine; and plainly for this reaſon, that it contains a greater proportion of eſſential oil, which it affords by diſtillation with water. Its virtues, whatever they are, depend upon this eſſential oil; for when this is drawn off by diſtillation, the reſinous ſubſtance remaining is without ſmell or taſte. The oil ſeparated has not been employed as a medicine; but I dare ſay it may, like oil of turpentine, be employed as HOFFMANN propoſes, with a double quantity of hog's-lard, in paralytic caſes.

THE entire balſam has been pretty much employed; but the virtues of it, like thoſe of the other balſams, have been very much miſtaken. A certain writer has treated profeſſedly of this balſam, but very differently from other monographers: He very candidly points out the miſchievous conſequences of its large uſe; and as it applies to the other balſams as well as this, I judge it will be for the inſtruction of ſtudents, if I ſhall here tranſcribe what Dr Hoppe has ſaid upon the ſubject.

After giving an account of the virtues commonly aſcribed to this balſam, he gives the following paragraph.

“ Hæc autem omnia in recenſitis affectibus præſtat ſub divina benedictione Balſamum Copayva, ſi genuinum nulloque mangonio corruptum vel infractum, debito tempore et modo, juſtaque quantitate a prudenti medico et exercitato chirurgo adhibetur, largiori enim doſi, vel longiori, quam par eſt, minuſve opportuno tempore aſſumtum ſulphure ſuo balſamico et acri ſenſiles tunicas primarum viarum extimulat, humores nimis exagitat, et ſic febres, hæmorrhagias, cephalalgias, cordis palpitationes, dolores et ardores ventris, aliaque incommoda parit. In ſpecie phthiſi et ulcere renum laborantibus abuſus balſami Braſilienſis facile tuſſim exaſperat, hæmoptoën et mictum cruentum infert, febremque lentam intendit. Nephriticis quoque frequentius et largius exhibitum dolores et inflammationes renum adauget. Dyſenteria maligna et lienteria notha, quæ ex denudatione tunicæ nerveæ ventriculi ac inteſtinorum oritur, vexatis balſamum noſtrum propinatum, vel clyſmatibus additum ſæpe ardores internos excitaſſe obſervavi. In omnibus igitur alvi fluoribus, ab humorum in primis viis collectorum acrimonia natis, et cum gravi inteſtinorum inflammatione junctis, balſamum Copayba aſſumtum plus obeſt, quam prodeſt. In mictu cruento et dyſuria ſenum, ab humorum ſalſedine producta, ſimiliter nocet, quia ſanguinem nimis commovet, et vias urinarias, jam dolorifice affectas, magis irritat. Nec etiam extus adhibitum balſamum Braſilienſe ſemper et ubivis conducit, quia vulneribus et ul-

" ceribus nondum ſatis deterſis, ſeu a pure inhærente liberatis, " admotum intempeſtive cicatricem inducit, et ſic ulcera ſæpe " numero ſinuoſa infert, quæ brevi tempore recrudeſcunt et " difficilius ſanantur." Ex Diſſertatione, D. FRID. WILH. HOPPE, apud Valentini Indiam literatam, p. 624.

IN late times, the chief uſe of the balſam copaivæ has been in the caſe of gleets; and of this I have ſpoken ſufficiently above on the ſubject of turpentine. I have been frequently diſappointed of its effects, perhaps from my miſtaking the nature of the caſe; but I believe frequently from its being taken in too ſmall quantity, the patient's ſtomach often refuſing to admit of a larger. I have ſometimes had ſucceſs with it, but have frequently found it too irritating and very hurtful. Wherever I could ſuſpect ulceration in the urinary paſſages, there it was eſpecially hurtful. With reſpect to its uſe in the fluor albus, I have nothing to add to what I ſaid above.

As I have obſerved above, that turpentine, in acting upon the inteſtines, proves laxative; ſo the ſame has been obſerved, and I have myſelf obſerved it, of balſam copaivæ. Whether a certain effect of balſam copaivæ is to be imputed to this operation, I cannot determine; but muſt obſerve what I have learned from an empirical practitioner, that it gives relief in hæmorrhoidal affections; and I have frequently employed it with ſucceſs: For this purpoſe, it is to be given from twenty to forty drops, properly mixed with powdered ſugar, once or twice a-day.

BALSAMUM PERUVIANUM.

THIS is a terebinthinate ſubſtance, and procured from a tree that is a ſpecies of the terebinthus. It is of a ſtronger flavour, and of more acrimony, than moſt others; but what peculiar virtues ariſe from hence is not well aſcertained. It was formerly much celebrated for the ſame virtues as the other balſams; but at preſent it is little uſed in our practice, poſſibly from our ſeldom having it in its genuine ſtate.

THE ſingular power in wounds of the nerves aſcribed to it by VAN SWIETEN, is not confirmed by the experience of our ſurgeons; who truſt more to cutting through the nerve, to emollient applications, and to the obviating the effects of the irritation by the internal uſe of opium, than to any balſam poured into the wound.

WE may readily admit of the virtue aſcribed to it by SYDENHAM, of curing the colica pictonum, as its laxative qualities are analogous to what we know of turpentine and balſam copaivæ.

THE warm commendations beſtowed by Dr HOFFMAN upon the tincture of it in ſpirit of wine, I have not attempted to examine by experience; but they appear to be no other than that of a general ſtimulant power, which poſſibly we can obtain from many other ſubſtances.

BALSAMUM TOLUTANUM.

THIS, with a very agreeable flavour, is in taſte the mildeſt of all the balſams. It has been celebrated for the ſame pectoral virtues as the others; and we can only ſay, that from its mildneſs, it may be the moſt innocent.

BENZOINUM.

THE place of this here is not the ſame that it holds in my catalogue; but I ſet it down here on my ſuppoſing a certain relation of it to the immediately foregoing balſams. The benzoin is a ſingular compoſition of an acid ſalt with an oily and reſinous ſubſtance; but as a ſaline matter of the ſame kind is found in moſt of the turpentines and balſams, it may be ſuppoſed that there is an affinity between this and all the balſams we have been mentioning.

It appears to me, that the benzoin affords an analogy for explaining the compoſition of all theſe; though chemiſtry is yet far from being able to explain the various combinations which nature makes in vegetables. For the chemical hiſtory of benzoine, I muſt refer to ſeveral late writers who have treated of it; but I take no notice of them, as they have thrown no light on its uſe in medicine.

The flowers, which is the only preparation employed, are manifeſtly a ſaline ſubſtance of the acid kind, of conſiderable acrimony and ſtimulant power, as I have found in every trial of them I have made. It has been recommended as a pectoral; and I have employed it in ſome aſthmatic caſes without finding it of uſe; and in a doſe of half a dram it appeared to be heating and hurtful.

STYRAX CALAMITA.

I subjoin this ſubſtance here, as it contains, though in leſs proportion, the ſame eſſential ſalt as the benzoin; and therefore may be ſuppoſed of the ſame nature and virtue. What theſe virtues are, is not at all aſcertained; and it is ſo little employed in our practice, that I have had no opportunity of judging of them from experience.

STYRAX LIQUIDA.

The origin of this is not well aſcertained; and therefore we have no analogy for aſcertaining the nature of it but from the name of Styrax, commonly applied to it. On account of the name, I have ſet it down here; and for this further reaſon, that the odour of it ſomewhat approaches to that of the ſtyrax calamita. If I conin its conſiſtence, and by the acrimony of its taſte, it greatly reſembles theſe.

Hitherto it has been almoſt only employed for external uſe; and in that, to what particular purpoſes it is adapted, is not well determined: but very lately I have been informed, from an empirical practice, that, mixed with ſome unctuous ſubſtances in the proportion of one part of ſtyrax to two of ung. baſilicon nigrum, it has been of remarkable ſervice in paralytic caſes, and particularly in a debility of the limbs following rickets.

G. RESINOSA.

Myrrha.

I begin with this, that I may not ſeparate ſubſtances which ſhould be conſidered together.

This is a gummy reſin, which has long been conſidered as a valuable medicine, and ſeems intitled to ſome eſteem by its ſenſible qualities, and by the acrid matter that a chemical examination ſhows it to contain.

Its proper virtues, however, ſeem to me to have been miſtaken. It manifeſtly ſtimulates the ſtomach, and, when taken in moderate quantity, promotes appetite and digeſtion; but taken in larger quantity, as in half a dram or two ſcruples for a doſe, it raiſes a diſagreeable ſenſation of heat in the ſtomach, and at the ſame time occaſions a frequency of pulſe and a ſenſe of heat over the whole body. From this power, it may ſometimes be uſeful in that flaccidity of the ſyſtem which is ſo often connected with a retention of the menſes; but we cannot perceive that it has any peculiar power of determining to the uterine veſſels, and therefore that it has not any title to be ſuppoſed, as it has uſually been, an emmenagogue. By its ſenſible qualities, it has not even ſo much pretenſion to that as the fetid gums.

ANOTHER virtue aſcribed to myrrh by ſeveral writers, and of late recommended in England, is that of a pectoral, and propoſed to be employed even in phthſical and hectic caſes. From my conſtant and frequently repeated obſervation of the heating qualities of myrrh, I cannot readily admit of ſuch a meaſure; and upon ſeveral trials, I have found no benefit from the uſe of it, and often manifeſtly harm from it, when it was either given largely or frequently repeated. I am pleaſed with the diſcretion of CARTHEUSER; who, though extravagant in the commendation of myrrh, has this paſſage: "Blande attenuat, et immi-
" nentem fluidorum non minus quam ſolidorum corruptionem
" avertit, vel jam præſentem, *febre lenta*, tamen aut *hectica*
" nondum ſtipatam, efficaciſſime corrigit."

THE myrrh has been much employed externally in ulcers of various kinds, and has been much celebrated for what are called its balſamic and its antiſeptic virtues. There is indeed no doubt of its poſſeſſing the virtues of the balſams; but its acrimony is perhaps greater than in any of theſe, and the whole of its virtues are now almoſt entirely deſerted by the preſent practitioners of ſurgery.

IF the virtues of myrrh are to be employed, they may be extracted either by water or ſpirit of wine; and, for moſt purpoſes, properly enough by a proof-ſpirit. The extracts by ſpirit of wine are more acrid; thoſe by water more mild.

IF its ſtimulant qualities are eſpecially required, Dr STAHL is right in alleging that the quantity of myrrh in the ſpirituous tincture will go as far as twice that quantity of the myrrh in ſubſtance. But if the opinion of the moſt part of phyſicians be to be followed, that the myrrh is moſt ſafely employed in a milder ſtate, the extraction by water will beſt anſwer the purpoſe; and it has been ſpeciouſly propoſed, that the myrrh in ſubſtance ſhould be given to be chewed in the mouth, and no part of it ſwallowed down but what is diſſolved in the ſaliva.

LADANUM.

THIS ſtands next in my catalogue; but I think it might have been omitted altogether, as it is never now employed internally as a medicine for any purpoſe whatever. It is retained indeed in the ſhops, and enters ſome external compoſitions; but it ſeems to be rather for its grateful odour than for any ſpecific virtue.

GUAIACUM.

THIS medicine was firſt brought into uſe for the cure of the venereal diſeaſe, ſoon after that diſeaſe firſt appeared in Europe. For ſome time after that period, it continued to be the remedy chiefly employed; and it is impoſſible to reject the teſtimonies given then, and frequently ſince, of the cures performed by it alone. There are, however, alſo many teſtimonies of its ineſſicacy; and as ſoon as the uſe and proper adminiſtration of mercury came to be known, the efficacy of this was found to be ſo conſiderable and certain, that it ſoon came to be the remedy generally employed, and at the ſame time the guaiacum came to be as generally neglected.

SOME indeed have ſince, particularly Dr BOERHAAVE, entertained a favourable opinion of its uſe in venereal caſes, under a proper adminiſtration; and ASTRUC has given a particular opinion, that it is eſpecially ſuited to ſyphilis combined with ſcrophula. I have had no opportunity of examining this later opinion by experiment; and with reſpect to its uſe in ſyphilis, I have not of late met with any inſtance in which the guaiacum alone was employed, nor do I know of any practitioners in Europe who now truſt to it alone, or who have had ſucceſs with it.

WE are therefore to ſay no more of the uſe of guaiacum in the venereal diſeaſe; but it has been celebrated for many other virtues. By many the continued uſe of the decoction has been commended for the cure of cutaneous ailments; and in ſome of theſe it has been ſometimes ſucceſsful: but as I find it difficult to diſtinguiſh the various ſpecies of theſe, I dare not abſolutely deny its power in this reſpect; but I can aſſert, that in many trials I have not perceived its efficacy in any. For the effects of gum guaiacum applied externally to cutaneous ſores, ſee HUNTER on the Venereal Diſeaſe.

IN caſes of chronic rheumatiſm its virtues are more certainly eſtabliſhed, and the employment of its decoction has been ſometimes ſucceſsful: but both becauſe the exhibition of large quantities of it is to moſt perſons diſagreeable, and becauſe its reſinous parts, in which its virtue chiefly reſides, are not well extracted by water, the uſe of the decoction is very much laid aſide, and even the extracts which have been propoſed to be made from it are hardly in uſe. It is the reſin that ſpontaneouſly flows from it in the countries in which it is produced that is now chiefly employed in rheumatic and gouty caſes.

WE have this medicine imported under the title of Gum Guaiacum; which is a ſubſtance containing a large proportion of reſin, and, as ſome ſay, to three fourths of its whole ſubſtance.

Though I am perſuaded that the virtues of this gum depend very entirely upon its reſinous part, we can hardly think it neceſſary to extract this reſin by itſelf, as, for moſt purpoſes, ſpirituous menſtruums extract it ſufficiently from the gum: and if an aqueous ſolution, which we judge to be often neceſſary, is to be employed, the gummy part favours the more ready diffuſion of the reſinous; and it ſeems therefore beſt in every caſe to employ the entire gum. The reſinous part ſeems to be very analogous to the nature of the balſams and turpentines above mentioned; and therefore it may be ſuppoſed, like theſe, to be very diffuſible in the ſyſtem, and thereby to have a conſiderable power in ſtimulating the extreme veſſels every where. It is indeed this which ſeems particularly to account for its power in chronic rheumatiſm.

As there can be no doubt of its paſſing off by the pores of the ſkin, it will therefore appear to be a probable remedy in ſome cutaneous diſorders. For theſe and other purpoſes it has been adminiſtered in different forms. It has been extracted by ſpirit of wine; and this ſtrongly impregnated with it, gives the balſamum guaiacinum of the London, and the elixir guaiacinum of the Edinburgh, diſpenſatories. Both of them, with little addition of virtue, are flavoured by a portion of balſam of Peru. Theſe preparations are extractions of the pure reſinous part; and whether it be with any advantage, either with reſpect to virtues or to more convenient exhibition, we are very doubtful.

BOTH colleges have alſo ordered the guaiacum to be extracted by the ſpiritus ſalis ammoniaci vinoſus, which is a combination of ſpirit of wine with the cauſtic volatile alkali; for though a mild alkali is preſcribed, it is truly the cauſtic only that can be combined with the ſpirit of wine. This menſtruum extracts the guaiacum very largely, and it is accordingly very much employed; but whether it gives much advantage to it ſeems to be uncertain. We are of opinion, that it often limits the doſe that might be otherwiſe given: and as, in many caſes, the guaiacum is too heating, ſo this form of it muſt be eſpecially ſuch. And as a ſolution of the gum in ſtrong rum or brandy may be given more freely and ſafely, and if I miſtake not has been given with equally good effects,

THIS leads me to ſpeak of the great fame which guaiacum has lately acquired in the cure of the gout. The guaiacum had been well eſteemed in England, both by **MEAD** and **PRINGLE**, for the cure of rheumatiſm; but its being a cure for the gout was firſt diſcovered by Mr **EMERIGON** of Martinico; who at firſt, from his own experience, aſſerted its power and ſucceſs in delivering entirely from the pains of the gout. This he ſoon after communicated to Europe, and the fame of it ſoon ſpread over the whole; and ſince that time, there have been many in every country of Europe who have employed this remedy.

IT conſiſts of two ounces of gum guaiac infuſed in three pounds averdupoiſe of good rum; and after digeſting for eight days, the tincture is poured off through paper, and the patient takes a table-ſpoonful of this every morning for a twelvemonth or more. The reports of the trials made, from different countries, have been very various. Many perſons have boaſted of its ſucceſs; but there are many alſo who complain of being diſappointed in their expectations. Several complain of their being hurt by it; and it appears that the adapting it properly to caſes and conſtitutions is not yet well aſcertained. It has been alleged by the patrons of it, that it may be given even when a fit of the gout is preſent; but I am certain, from ſeveral inſtances, that this is a very hurtful practice. For my own part, I have known ſeveral who have taken it with the effect of putting off their fits of the gout for a long time, but none in whom they did not return. In one inſtance, the gout, in a perſon liable to annual fits, had none for two years, but became, by degrees, affected with a hydrothorax, of which he died; and I ſuſpect that ſeveral others who have taken the tincture of guaiacum have undergone the ſame fate: for, from the experience of the Portland powder and other remedies, I am perſuaded there can hardly be found a means of preventing inflammatory fits of the gout, without inducing an atonic and dangerous ſtate of the ſyſtem.

SEVERAL phyſicians have apprehended miſchief from the uſe of the guaiacum in a ſpirituous tincture; and I am certain that it ſometimes happens. It is therefore that, in imitation of the very reſpectable BERGER of Copenhagen, I avoid the ſpirituous tincture of guaiacum, and employ almoſt only the diffuſion of it in water. In preparing this, having firſt, with an equal part of hard ſugar, reduced the guaiacum to a fine powder, I apply ſome portion of the yolk of egg, or of a mucilage of gum arabic, and rubbing theſe together very carefully, I form an emulſion with water, or watery liquors, as may be thought proper. This preparation I give over night, in ſuch a quantity as may open the belly once next day; which will happen to different perſons from doſes containing from fifteen to thirty grains of the guaiacum. In imitation of the late Sir John Pringle, I uſe this preparation for ſome time together in chronic rheumatiſm; but I never employ it for a great length of time with a view to prevent fits of the gout, as I would, for the reaſons given above, think this a dangerous practice: but when diſorders of the ſtomach, or wandering pains in other parts of the body, can be imputed to atonic or retrocedent gout, I have frequently employed it, and, as I judge, with great advantage.

SARSAPARILLA.

THIS is ſet down here becauſe it ſo frequently accompanies the guaiacum in practice; but if I was to conſult my own experience alone, I ſhould not give this root a place in the materia medica: for, tried in every ſhape, I have never found it an effectual medicine in ſyphilis or any other diſeaſe. Other phyſicians, however, have had a better opinion of it, and have communicated this to the public; which I leave my readers to conſult, and to follow their opinions if they ſhall think proper.

SASSAFRAS.

THIS is a wood whoſe ſenſible qualities are more conſiderable; and as it contains a large portion of a very acrid eſſential oil, it may be preſumed to have virtues; but what theſe are I have not been able to aſcertain. I muſt indeed acknowledge, that I have never employed it with any conſtancy, or in large quantity, in any diſeaſe; nor do I know that ſuch uſe of it has been attempted in modern practice.

IT is commonly extracted by infuſion only, and the long decoction of it is commonly avoided; but this practice is not very well founded, as the decoction is found impregnated with active parts. This wood is ſaid to be diaphoretic, and I believe juſtly; for I have found that a watery infuſion of it, taken warm and pretty largely, was very effectual in promoting ſweat; but to what particular purpoſe this ſweating was applicable, I have not been able to determine.

Santalum Citrinum.

This ſtill holds a place in our diſpenſatory liſts; and, by the eſſential oil and reſin it contains, it may certainly be an active medicine: but though Dr **Hoffman** has been a little extravagant in its praiſes, his authority has not been ſufficient to have it retained in the preſent practice. It may perhaps be neglected, as we have probably in our hands many other medicines of equal virtues.

H. AROMATA.

After treating of the verticillatæ and umbellatæ as ſtimulants, having this quality from the eſſential oil abounding in them, for the moſt part of a grateful odour, I have here put down thoſe ſubſtances which, though not connected by any botanical affinity, have their virtues very manifeſtly depending upon their eſſential oil, generally of the moſt grateful odour, and from which the idea of aromatic has been chiefly taken.

These aromatics are almoſt all of them the produce of very warm climates, and their oils have generally the property of ſinking in water. They are all of them conſiderably acrid and inflaming when applied to the ſkin; and when given internally, they ſtimulate the ſtomach ſo much as to ſhow very ſtrongly antiſpaſmodic and carminative virtues. At the ſame time, they ſtimulate the energy of the brain ſo much as to affect the heart and ſanguiferous ſyſtem, and are therefore juſtly eſteemed cordial. They manifeſtly increaſe the frequency of the pulſe and the heat of the body, and are therefore ready to prove hurtful in all caſes where theſe circumſtances are already preternaturally increaſed, and eſpecially in all caſes wherein a phlogiſtic diatheſis prevails in the ſyſtem.

CINNAMOMUM.

THIS is an aromatic of the moſt grateful fragrance. Its oil is ſufficiently acrid; but not being in large proportion in the ſubſtance of the cinnamon as nature produces it, this may be employed more ſafely than moſt of the other aromatics.

As it is a bark, its aromatic qualities are accompanied with ſomewhat aſtringent, which may determine its being employed in certain caſes rather than ſome of the other aromatics; but the aſtringent quality is not conſiderable, and can never be truſted to by itſelf.

ITS aromatic qualities are extracted by water in infuſion, but more powerfully by it in diſtillation; and in both ways alſo by a proof-ſpirit applied: and both the Britiſh diſpenſatories have now alſo ordered a tincture of it made with proof-ſpirit. In all theſe ways it may be agreeably employed: but we ſhould never loſe ſight of its being ſtimulant and heating; for even the ſimple diſtilled water, when frequently employed, has proved hurtfully irritating to the fauces.

THE eſſential oil is only obtained by us as imported from the Eaſt Indies; and, when obtained in its genuine ſtate, it is one of the moſt agreeable and powerful aromatics we can employ.

OUR college has now received into their materia medica liſt the CASSIA LIGNEA, which has all the qualities of the cinnamon only in a much weaker degree, and at the ſame time with no other peculiar virtue. It differs from the cinnamon by its containing a conſiderable quantity of mucilaginous matter; but we do not perceive that this can adapt it to any particular purpoſe.

CARYOPHILLI.

THIS is an aromatic of a very agreeable odour, and contains a large proportion of eſſential oil, by which it has all the virtues we have aſcribed to aromatics in general. This oil, as diſtilled in this country from the cloves imported, does not appear to be a very acrid matter; but we have got imported from Holland an oil under this title of very great acrimony. It is ſuch an acrimony as we find in the extract of cloves obtained by means of ſpirit of wine; and it is therefore commonly ſuppoſed that the oil imported from abroad has its great acrimony from a quantity of the reſin obtained by ſpirit of wine mixed with the oil. By this admixture it is certainly rendered more powerful for external uſe; and how far, when the doſe is properly choſen, it is rendered unfit for internal uſe, I cannot well determine.

NUX MOSCHATA.

THIS is a ſubſtance abounding in oily matter, which is of two kinds; the one fixed, the other volatile, ariſing by diſtillation both with water and ſpirit. The fixed oily part is a butyraceous matter, without taſte or ſmell, and therefore of no peculiar uſe in medicine. The volatile portion of it is of two kinds, as a part of it appears, in a thin fluid oil, and another part of it diſpoſed to congeal, puts on ſomewhat of the appearance of camphire, but has not however the nature of that ſubſtance.

THE active parts of nutmeg may be obtained not only by diſtillation, but alſo by a ſimple expreſſion of the bruiſed nutmeg, when a butyraceous ſubſtance is obtained, known in our ſhops under the title of the Oleum macis expreſſum, having much of the odour of the entire nutmeg. It is commonly imported to us from abroad, but ſeldom in its genuine ſtate.

NUTMEG is an aromatic, to moſt perſons of a grateful odour and taſte; but on account of the admixture of an inert ſebaceous matter, it is of a leſs acrid taſte than ſeveral other aromatics. By its volatile parts, it is a medicine of conſiderable power, and has all the virtues of the other aromatics, both with reſpect to the alimentary canal and to the whole ſyſtem.

SOME writers have mentioned its hypnotic power; but Dr LEWIS, by his manner of expreſſing himſelf, does not ſeem to have known this from his own obſervation. BONTIUS, however, ſpeaks of it as a matter of frequent occurrence in the Eaſt Indies, which had often fallen under his own obſervation; and in the Ephemerides Germanicæ, Dec. II^{da}, Annus II^{dus}, Obſ. 120. we have an account of ſome extraordinary effects on the nervous ſyſtem occaſioned by the taking in a large quantity of nutmeg. I have myſelf had an accidental occaſion of obſerving its ſoporific and ſtupifying power. A perſon by miſtake took two drams or a little more of powdered nutmeg: he felt it warm in his ſtomach, without any uneaſineſs; but in about an hour after he had taken it, he was ſeized with a drowſineſs, which gradually increaſed to a complete ſtupor and inſenſibility; and not long after he was found fallen from his chair, lying on the floor of his chamber in the ſtate mentioned. Being laid a-bed he fell aſleep; but waking a little from time to time, he was quite delirious: and he thus continued alternately ſleeping and delirious for ſeveral hours. By degrees, however, both theſe ſymptoms gradually diminiſhed, ſo that in about ſix hours from the time of taking the nutmeg he was pretty well recovered from both. Although he ſtill complained of headach and ſome drowſineſs, he ſlept naturally and quietly through the following night, and next day was quite in his ordinary health.

THERE is no doubt that this was entirely the effect of the nutmeg; and it is to me probable, that ſeveral other aromatics, taken in large doſes, might have the ſame effects: from which I am of opinion, that in general the large uſe of them in apoplectic and paralytic caſes may be very improper.

I HAVE only to obſerve further with reſpect to nutmeg, that its active parts are not diſſipated by moderate boiling. The preparation of the nux moſchata condita does not, as in many other inſtances of the Condita, deprive the nutmeg of its virtues; while it gives us a preparation convenient for ſeveral formulæ in which the nutmeg may be employed.

MACIS.

THIS is a part of the ſame fruit as the nutmeg, and has therefore very much of the ſame qualities, only it is of a ſomewhat different odour and taſte; and it contains an oil, or at leaſt a part of an oil, that is more volatile, and ſomewhat more acrid.

PIMENTO.

THE aromatics hitherto mentioned are productions of the Eaſt Indies: the one we are now to mention is entirely from the Weſt Indies, very much however of the ſame qualities as the Oriental aromatics. It is of a fragrant and agreeable odour of a peculiar kind, and ſeems as if it were a combination of ſeveral of thoſe we have already mentioned. Like theſe it contains a large portion of eſſential oil that ſinks in water. Its only uſe is as a condiment to food, and has not any peculiar virtues in medicine that I am yet acquainted with.

CARDAMOMUM.

THE ſpecies of amomum diſtinguiſhed by the title of Cardamomum Minus. It is a ſeed of a grateful aromatic odour and taſte; but not ſo acrid as ſeveral others. It has the common qualities of the other aromatics, depending upon an eſſential oil; that differs, however, from the others we have mentioned, as not ſinking in water.

THERE is another ſpecies of the amomum, formerly kept in our ſhops under the title of GRANA PARADISI; but as being preciſely of the ſame nature with the cardamomum minus, and of weaker quality, it is now properly omitted.

GINGIBER.

THIS root is from a plant of the ſame genus with the former, and like it contains an eſſential oil of an acrid aromatic kind: it has therefore the ſame qualities of antiſpaſmodic and carminative as the other aromatics. Its odour is to me leſs fragrant and agreeable; but its taſte is more pungent and heating. By my obſervation, it is equally heating to the ſyſtem as the other aromatics; and why Dr LEWIS thought it not ſo, I cannot underſtand; nor do I find that the fixed nature of its active principles accounts for this, as in ſeveral aromatics, ſuch as cloves and pepper, their fixed parts are more acrid than their volatile.

THIS root has much of its active parts extracted by water, and therefore it may be properly employed in infuſions; and its infuſion is properly enough converted into a ſyrup: But in doing this, it is not neceſſary, as both the Colleges of London and Edinburgh have preſcribed to avoid boiling; for, as has been already obſerved, its active parts are not diſſipated by boiling: and by boiling the ginger in water, a more powerful and equally agreeable ſyrup may be prepared at a leſs expence. It is on account of the ſame fixed nature of the active parts of ginger, that the gingiber conditum is a ſufficiently active preparation of it, convenient in ſeveral formulæ; but that imported from the Eaſt or Weſt Indies is to be preferred to any preparation of it made in this country.

ZEDOARIA.

I HAVE ſet down this here as of the ſame genus of plants with the two laſt mentioned; but I hardly think it deſerves the place it has hitherto held in our practice. Its odour and taſte are leſs agreeable than that of any other of the aromatics hitherto mentioned; and its bitterneſs is too inconſiderable to give it a place amongſt the tonics. I am clear that it might ſafely be omitted in our liſts of the materia medica. As containing a camphire, it may have virtues; but I cannot find that from thence it is applicable with advantage to any particular purpoſe; though I have mentioned above the extravagant commendations given of it by CARTHEUSER.

PIPER.

THIS is the aromatic which, as a condiment of our food, is much more frequently employed than any other: Its odour is leſs fragrant and agreeable than moſt of the others mentioned, and therefore perhaps leſs liable to pall upon us than theſe others, whilſt its taſte is more pungent and durable. It contains an eſſential oil, which, like that of the other aromatics, ſinks in water, but is leſs acrid than the pepper itſelf: and it appears from the experiments of GAUBIUS, that the moſt active parts of pepper are of a very fixed nature. They may be taken out by water; and by inſpiſſating the decoction may be got in the form of an extract of the moſt acrid quality. By this part, which ſeems to be a reſinous ſubſtance, and by its eſſential oil, it has all the powers and virtues of the other aromatics.

NEWMANN, however, from attending only to the qualities of the eſſential oil, has ſuppoſed pepper leſs heating to the ſyſtem than other aromatics; and the late learned Dr GAUBIUS has entered into the ſame opinion. For ſupporting it he appeals to his own experience; and ſays pointedly, that from any, and even large quantities taken in, he never found it warm on his ſtomach, or to increaſe the frequency of his pulſe.

THIS I ſuſpect to have been owing to habit, from his frequent uſe of it; for my experience has been of a contrary kind. I have all my life had a diſlike to the odour and taſte of pepper: which I aſcribe to an inſtinct of my conſtitution; for when I have taken this ſpicery, though in a ſmall quantity, it always felt warm in my ſtomach, and my whole body was heated by it.

IT ſeems to me that LINNÆUS and BERGIUS judge very properly, and probably from experience, in aſcribing a calefacient power to pepper: And Dr LEWIS is expreſsly of opinion, that pepper heats the conſtitution more than ſome other ſpices that are of equal pungency upon the palate.

BONTIUS properly treats as ridiculous the opinion of the Javaneſe, who conſider pepper as of a cold nature. The univerſal uſe of it in India not proving remarkably hurtful, which

GAUBIUS appeals to, may be conſidered as the effect of much habit, which the uſe of vegetable food has introduced: and it may be maintained, that the popular opinion of its innocence, and even of its utility, is given upon no ſolid ground, but merely in vindication of popular practice; which in ſeveral like inſtances has given occaſion to ſuch popular errors.

FOR the heating powers of pepper, I would require no other proof than that it is effectually employed for preventing the return of the paroxyſms of intermittent fevers, by being given ſome time before an expected acceſſion; and which purpoſe I think it can no otherwiſe anſwer than by exciting a conſiderable degree of heat in the ſyſtem. For its heating effects ſee V. SWIETEN, Comm. in BOERH. Vol. II. p. 31.

PIPER LONGUM.

THIS is the product of the ſame genus as the former: It has preciſely the ſame qualities, only in a weaker degree; and therefore ſhould not have had the place of it, that it has had, in ſome of our ſhop-compoſitions, as in the tinctura aromatica both of the London and Edinburgh diſpenſatories, in the vinum amarum, the pulvis e bolo compoſitus, the ſpecies aromaticæ, and the confectio paulina of the former; in all of which the piper nigrum might have been as properly employed. Dr LEWIS judges the long pepper to be warmer than the black; but BERGIUS judges otherwiſe, and ſo do I.

CUBEBÆ.

THIS alſo is from the ſame genus of plants as the two kinds of pepper mentioned, and has the ſame qualities, but in a ſtill weaker degree, and therefore might be left out of our liſt: but their odour is more fragrant and agreeable than either of the peppers; and they make a more agreeable ingredient in the vinum amarum than either the pepper or the ginger.

CAPSICUM.

THIS is given in our diſpenſatories under the title of Piper Indicum; and though from a very different genus of plants, it has been from its acrimony univerſally named a Pepper. It has the acrimony of the pepper in its taſte, but without any of the odour of that, or any other aromatic that I know of. It is now very univerſally employed as a condiment, but has hardly yet had any place in medicinal preſcription.

A particular uſe to which it may be applied is to be learned from the following paſſage and preſcription in BERGIUS.

" R. Semin. piper. Ind. gr. vi. bacc. laur. ℈ij. M. f. pulvis, dividendus in tres partes æquales; quarum prima portio ſumenda incipiente primo rigore, ſecunda poſtridie eadem hora; tertia vero tertio die. Sæpiſſimæ vidi febres intermittentes protractas hocce pulvere curatas plerumque ſine relapſu."

CANELLA ALBA.

THIS is a ſubſtance, both by its odour and taſte, to be reckoned amongſt the aromatics; but theſe qualities are in a weaker degree than in moſt of the aromatics we have mentioned. It has no peculiar virtues, and has only been employed for improving the odour and taſte of bitters; which purpoſe it anſwers in the tinctura amara of the Edinburgh diſpenſatory better than the ginger propoſed to be employed by the London College.

CORTEX WINTERANUS.

UNDER this title, for a long time paſt, the canella alba has been employed all over Europe; and it is ſtill in Britain only that a genuine *Winter*'s bark is yet known. BERGIUS has this obſervation: "Plurimi auctores corticem Winteranum a canella alba diſtinguunt; mihi vero alius cortex Winteranus, quam hic, ignotus eſt."

THIS is the ſtate of matters in other countries; but of late years our circumnavigators have brought us from the Straits of Magellan a bark which is certainly the original Winter's bark, and is a ſubſtance conſiderably different from the canella alba. By the accounts which the late Dr FOTHERGILL has inſerted in the London Med. Obſ. the genuine Winter's bark appears to be a light and grateful aromatic bitter; but of what particular uſe it may be of in medicine is not yet aſcertained. Its being a preſervative againſt the ſcurvy is not aſcertained upon any clear foundation. For all that we know concerning it, I muſt refer to the London Med. Obſ.

I. ACRIA.

ARUM.

THIS root is of a ſingular compoſition. As it is produced in the earth it contains an acrid matter which is not to be extracted by ſpirit of wine, and is not therefore an eſſential oil. Though this acrid matter gives out no odour, its acrimony readily paſſes off in drying, and exhales under decoction in water; but it does not riſe with either water or ſpirit in diſtillation ſo as to give any impregnation to the diſtilled liquor.

Beside this acrid matter, which is in ſmall proportion to the whole, the root conſiſts of a farinaceous and nutritious matter: It is therefore the acrid matter only that renders it an active medicine. The acrimony of it appears in the application of the freſh root to the ſkin; which, if delicate, is reddened by it, and ſome bliſtering is excited: but in this reſpect it is not ſo inflammatory as ſeveral other ſubſtances mentioned above. Taken internally, it ſtimulates the ſtomach, and excites the activity of the digeſtive powers when they happen to be languid; and we have this proof of its ſtimulating the whole ſyſtem, that, like other ſtimulants, it has been uſeful in intermittent fevers.

Bergius gives an account of its ſingular virtue in curing certain headachs; and that there may be no miſtake of his meaning, it ſeems proper to lay the whole paragraph before my readers. “ Præclarum effectum identidem expertus ſum ex
“ hac radice, alcalinis, abſorbentibus et aromatibus maritata,
“ in cephalæis ſympaticis pertinaciſſimis. Hæc ſpecies cepha-
“ læae omnes eluſerat medelas, antequam in pulverem ari com-
“ poſitum incidebam. Scilicet ſympatica ea eſt aprimis viis,
“ forte ab atrabili profecta dolore capitis inſane vehementi cru-
“ ciantur ægri ſæpe per intervalla recrudeſcente, abſque febre,
“ pulſu ſubinde nimis tardo, plerumque vero naturali. Sæpe
“ linguæ baſis ipſique dentes nigreſcunt, velut apud illos qui
“ ore tabaci fumum hauriunt. Venæſectiones hirudines, ſcari-
“ ficationes, veſicatoria, laxantia, aquæ minerales, in hac ſpecie
“ cephalææ nihil efficiunt, ſed ſæpe augent dolorem; quod
“ etiam accidit a propinatis ſalinis. Sed pulvis ari compoſitus
“ nunquam non ſolatium attulit. In febribus intermittentibus
“ pulveris dedi quovis bihorio e Rad. ari ſolid. et tart. vitriol.
“ ā ℈ſs. rhei ſel. gr. v. Illi purgarunt alvum mediocriter, et ſub-
“ inde febrem ſuſtulerunt, quandoque abſque relapſu; ſed apud

" ſenſibiliores tormina excitarunt, quare doſis ari tunc diminu-
" enda fuit."

JUNCKER tells us that, given with brandy, it is a very powerful ſudorific; but the accuracy and judgment of that author deſerve very little attention.

FORMERLY it has been frequently employed in the practice of England; but in this country, ſo far as I know, very little. In England it was eſpecially employed in the pulvis ari compoſitus of the laſt edition of the London diſpenſatory, which was a very injudicious compoſition, and is now entirely omitted. The pulvis ari compoſitus of the Edinburgh diſpenſatory 1756 is ſomewhat better; but ſtill ſo much loaded with other ingredients as to render it uncertain what may be the effect of the arum, what of the other ingredients; and it is in the later editions, as an officinal compoſition, properly omitted.

BERGIUS propoſes to mix it only with an equal part of vitriolated tartar and half the quantity of rhubarb. Dr LEWIS, finding that the pungency of it may be well covered with mucilaginous and oily ſubſtances, propoſes two parts of the root, two of gum arabic, and one of ſpermaceti, to be well rubbed together, and then made into an emulſion with any watery liquor. " In theſe forms (he ſays) I have given the freſh root
" from ten grains to upwards of a ſcruple three or four times
" a-day: it generally occaſioned a ſenſation of ſlight warmth,
" firſt about the ſtomach, and afterwards in the remoter parts;
" manifeſtly promoted perſpiration, and frequently produced a
" plentiful ſweat. Several obſtinate rheumatic pains were re-
" moved by this medicine, which is therefore recommended to
" further trial."

Bergius direćts this root to be gathered only when it has ripened its ſeeds, and the plant begins to decay: and Dr **Lewis** gives, I think, the proper reaſon of this. He ſuppoſes that the root is of ſufficient vigour for medicinal uſe at all periods of its growth; but as it has hitherto been uſed only in a dry ſtate, it has been generally taken up about the time of the plant's beginning to die; as the root is then leaſt juicy, and ſhrinks leaſt in drying.

MEZEREON.

THIS plant, as one of the moſt acrid, though omitted in our catalogue, deſerves to be taken notice of here.

IT is the bark of the root of this ſhrub that is only employed; the woody part of the root is quite inſipid: and apothecaries deceive themſelves in taking any part of the wood along with the bark. This bark contains a very acrid matter, which, applied to the ſkin, readily excites a bliſter and a conſiderable diſcharge of ſerum: and as by repeated applications this can be continued without any eroſion of the part, it has been frequently employed in France as a perpetual iſſue, with all the effećts of ſuch remedies. Direćtions are given for the management of it by Mr Baume in the laſt edition of his Elemens de Pharmacie. They are given more fully in Eſſai ſur l'Uſage et les Effets de l'Ecorce du Garou, par M. Archange le Roy, Paris 1767, and they are alſo tranſcribed by **Bergius**.

THE mezereon to be uſed internally, is taken in a decoction of two drams of the root, boiled in three pounds of water into two; and the whole of this is taken at ſeveral draughts in the courſe of twenty-four hours. In this proportion it proves ſomewhat warm on the ſtomach, and in larger proportion it gives a painful warmth, with ſickneſs, and even vomiting. It ſometimes renders the pulſe frequent, and heats the whole body. It has long had the reputation of curing venereal nodes which mercury had failed to do; and for its uſe in ſuch caſes ſee RUSSELL in Lond. Med. Obſ. Vol. III. art. 22.

IT is likewiſe ſaid to cure other remains of the venereal diſeaſe, which mercury taken in large quantities had failed to do: And in one caſe of ulcerations in many different parts of the body, which remained after mercury had been long and largely employed, I have found them entirely cured by the uſe of the decoction of mezereon for two or three weeks.

DR HOME has not only found this decoction to cure ſcirrhous tumours which remain after the venereal diſeaſe, and after the uſe of mercury, but that it healed alſo ſome ſcirrhous tumours from other cauſes. I have frequently employed it in ſeveral cutaneous affections, and ſometimes with ſucceſs.

PULSATILLA NIGRICANS.

THIS is one of the remedies which we owe to the benevolent induſtry of Baron STORCK; but he has aſcribed to it ſo many wonderful effects, that his credit is hurt with many perſons, and has made many neglect to give this remedy a frequent and fair trial. It has particularly concurred with this in Scotland, that the plant is not a native of this country, and that there has not been ready acceſs to it: But whatever may become of the credit of Baron STORCK's experiments, I muſt obſerve that the plant is an acrid ſubſtance, and therefore capable of being active; and from the ſingular matter reſembling camphire which water diſtilled from it contains, it may have peculiar powers and virtues.

I would ſtill recommend it to the attention of my countrymen, and particularly to a repetition of trials in that diſeaſe ſo frequently otherwiſe incurable, the amauroſis. The negative experiments of BERGIUS and others are not ſufficient to diſcourage all trials, conſidering that the diſeaſe may depend upon different cauſes; ſome of which may yield to remedies, though others do not.

BESIDES the whole of the above liſt, there are ſome other ſtimulants which have been formerly employed in medicine; but not diſcovering any peculiar qualities, they have been of late neglected: and I have therefore now taken notice only of the few that ſtill keep a place in our diſpenſatory liſts. In making theſe omiſſions, I cannot however fail to obſerve, that it is from the moſt acrid, and perhaps poiſonous ſubſtances, that is, in thoſe which act moſt powerfully on the human body, that we are to expect powerful remedies; and though they are at preſent properly omitted in our diſpenſatory liſts, as not proper to embarraſs the apothecary, they are, however, proper objects of inquiry to all perſons who would improve the practice of phyſic.

CHAPTER VI.

SEDANTIA.

THESE are the medicines which directly, and without evacuation, diminiſh the motions and powers of the human ſyſtem. They are of different kinds, as they act more immediately upon the nervous or ſanguiferous ſyſtems; and we are to treat of them accordingly under the titles of Narcotics or Refrigerants; the former to be firſt conſidered here.

SECT. I.

Of NARCOTICS.

THESE are the medicines which diminiſh the ſenſibility and irritability of the ſyſtem, and thereby the motions and the powers of motion in it. They are commonly remarkable for inducing that ceſſation of ſenſe and motion in which ſleep conſiſts; and are therefore often named *Soporific* or *Hypnotic* medicines.

As their power and operation may be extended ſo far as to extinguiſh the vital principle altogether, they form that ſet of ſubſtances which are properly, and ſuch as may be ſtrictly, called the *Poiſonous*.

As the powers of ſenſe and motion chiefly depend upon the ſtate of the brain, ſo it has been commonly ſuppoſed that the medicines we treat of act primarily and eſpecially upon that organ: but not to mention the objections that might be made to any hypotheſis that has been maintained on this ſubject; it will be enough to remark, that as the operation of narcotics diminiſhes the motions and powers of motion, eſpecially in the parts to which they are immediately applied, and that they do this in parts which are entirely removed from all connection with the brain; we muſt conclude, that their operation is upon a matter in common to the whole of the nervous ſyſtem.

To be more explicit on this ſubject, we aſſume the hypotheſis we have before maintained, that there is a ſubtile elaſtic fluid inherent in the medullary ſubſtance of the brain and nerves, upon the motions of which all ſenſe and vital motions depend; and by which, therefore, motions are communicated from every one part to every other of the nervous ſyſtem.

FROM many phenomena it appears, that the mobility of this fluid may be more or leſs at different times; and particularly that it may be affected in theſe reſpects by external bodies applied to the nerves. Such then we conceive to be the operation of narcotic medicines, that they diminiſh the mobility of the nervous power, and in a certain quantity can deſtroy that mobility altogether. This is in general the operation of narcotic ſedatives; but it ſuffers various modifications, which, tho' we cannot clearly explain, we ſhall, in conſidering the particular narcotics, endeavour to go further than has been done before.

After this general idea of the operation of narcotics, it is to be remarked, that although their operation is, as we have ſaid, firſt and eſpecially on the nerves to which they are immediately applied, they are very conſtantly at the ſame time communicated to other communicating nerves, more or leſs, according to the number and ſenſibility of the nerves to which they are firſt applied.

The moſt remarkable and frequent inſtance of this is in the application of narcotics to the internal ſurface of the ſtomach; where both the number and peculiar ſenſibility of the nerves give occaſion to a very extenſive widely diffuſed operation: for it is to be further remarked, that almoſt every application to a particular part is communicated more or leſs to the origin of the nerves or common ſenſorium; from which, again, its operation is more or leſs communicated to the whole ſyſtem.

From the accounts juſt now given, it will be obvious, that it is eſpecially and moſt commonly from the operation of narcotics on the ſtomach, communicated to the brain, that general effects ſo readily appear in the whole ſyſtem: and it is accordingly theſe effects extending from the ſenſorium to the whole ſyſtem that have been chiefly attended to in the operation of narcotics.

But it is proper to be more particular, and therefore to obſerve, that the effects of our narcotics commonly and eſpecially firſt appear in thoſe functions in which the mobility of the nervous fluid admits the moſt readily of a change; that is, the animal functions, in the ceſſation of which ſleep conſiſts: and therefore it is that this is ſo commonly induced.

At the ſame time, the effects appear alſo in the vital functions, ſo far, that the motions of theſe are weakened, and the frequency of their action rendered leſs; and although this, from conſiderations to be mentioned afterwards, may not conſtantly appear, there are however innumerable experiments which prove, that it is frequently, and even commonly, the effect of narcotics.

The power of narcotics in diminiſhing the mobility of the nervous power appears ſtill more conſiderably, and without ambiguity, in the natural functions. Thus, the activity of the alimentary canal, that chief organ of the natural functions, is always diminiſhed by narcotics any how thrown into the body.

Another effect of narcotics relative to the natural functions, is the diminution and ſuſpenſion of all ſecretions, and of every excretion except that of ſweat.

From all this it appears, that the operation of narcotics extends to every function depending upon the energy of the brain: with reſpect to which they ſhow a ſedative power; which, though various in its degree, and variouſly modified, both by the different conditions of the narcotic and by the different conditions of the body to which it is applied, yet the effects are univerſally and directly ſedative.

There is however here a conſiderable difficulty occurring; as it is to be particularly remarked, that narcotics, inſtead of proving always ſedative, or diminiſhing the action of the heart, they often ſeem to be powerfully ſtimulant with reſpect to this, and in their firſt operation often increaſe the force and frequency of its action.

How this, in conſiſtency with our general doctrine, may be explained, is difficult to ſay. Some have imagined, that in the ſame narcotic ſubſtance there is a ſtimulant as well as a ſedative matter: And that they have ſome foundation for this opinion, appears from this, that the ſubſtance of the narcotic is acrid to the taſte, and when applied to the ſkin readily inflames it; and that in wine, or other ardent ſpirits commonly acting as narcotics, the ſtimulant matter is in large proportion, may be readily admitted.

BUT on the other hand, the direct ſtimulant power is doubtful; as in many ſubſtances the ſedative power appears in maſſes of ſo very ſmall bulk: and in that bulk the ſtimulant matter can hardly be in ſuch proportion as to ſtimulate the heart very powerfully; as we know no other inſtance of a pure ſtimulant that in the ſame bulk will have that effect, even when applied to the ſtomach or in any other way to the body. Another conſideration may be alſo offered here. There is no ground to ſuppoſe, that where a ſtimulant and ſedative power are combined in the ſame matter, that, as frequently happens here, the ſtimulant power ſhould commonly act before the ſedative.

To explain therefore the ſtimulant effects that often appear from the exhibition of narcotics, it ſeems neceſſary to aſſign ſome other cauſe than the direct ſtimulant power of the ſubſtance applied; and it appears to be that reſiſtance and conſequent activity, which the animal œconomy is ſuited to oppoſe to every application that has a tendency to hurt it.

THIS power, as we have ſaid before, is well known in the ſchools of phyſic, under the title of the *Vis Conſervatrix* et *Medicatrix Naturæ;* which, however difficult to explain, muſt, as a general law of the animal œconomy, be admitted as a matter of fact, as we have above, on the ſubject of ſtimulants, endeavoured to prove very fully.

WE have no doubt that it might be fairly employed here, to account for the ſtimulant effects which ſo often appear upon the exhibition of narcotics, which are indeed very often evident and conſiderable; but they do not imply any directly ſtimulant power in the narcotic ſubſtance, as they can be ſo well accounted for by conſidering them as indirect ſtimulants, in the manner we have both here and above explained.

I WILL only add one other illuſtration on this ſubject. It is frequently the effect of narcotics to excite that delirium which is well known under the name of Ebriety or Drunkenneſs. This often appearing with the ſame circumſtances that are aſcribed to a ſtimulant power, has been frequently ſuppoſed to ariſe from a ſtimulus applied to the brain: And it is true that it does in ſome meaſure depend upon the ſtimulant operation which here takes place in the manner we have explained: but were it proper here, it might be ſhown by the laws of the animal œconomy, that a ſtimulus is commonly inſufficient; and that it is only by the concurrence of a ſedative power that the ſymptoms of ebriety, produced by the exhibition of narcotics, can be accounted for.

WE conclude therefore upon the whole, that the operation of narcotics is always directly ſedative. But before we proceed to illuſtrate this in particulars, it will be proper to take notice of a circumſtance that relates to the operation of ſedatives in general. With reſpect to them, it is to be remarked, that when ſedatives thrown into the body do not prove abſolutely mortal, their operation is of a certain duration only; and therefore, after a certain time, or at leaſt ſooner or later, according to circumſtances, it entirely ceaſes, or at leaſt that its effects are greatly diminiſhed.

It is in conſequence of this that, when for the purpoſes of medicine, it is neceſſary that the effects of narcotics be continued. This can only be done by a repetition in due time of the ſedative: and upon ſuch occaſions it is found, that the law of the œconomy, by which all impreſſions which do not excite to action by repetition become weaker, here takes place; and therefore that, in the repetition of narcotics, the impreſſion, that is, the doſe, muſt be made ſtronger than before. This happens very conſtantly in the repetition of narcotics; and to perſons acquainted with the powers of cuſtom, affords an argument, that in moſt inſtances thoſe narcotics act by their ſedative rather than by their ſtimulant powers.

This ceaſing of the effects of narcotics is difficult to explain: and to do it, we muſt take notice that it is connected with a queſtion occurring with reſpect to natural ſleep, which is, Whether this, after it has taken place for ſome time, always ceaſes from ſtimuli applied? or if it ceaſes ſpontaneouſly upon the ſyſtem being reſtored to the ſtate in which it was before the cauſes of ſleep were applied? The latter account will be adopted by thoſe who ſuppoſe the nervous fluid to be a ſecretion that may be exhauſted and again reſtored and ſupplied. But this is a ſuppoſition ſo improbable, that I believe few maintain it at preſent: and if ſo, the queſtion returns to ſay, How the ſtate of the nervous fluid, either when natural ſleep has ſubſiſted for ſome time, or when it has been artificially induced by narcotics, returns or is reſtored to its waking condition?

ALTHOUGH it may be difficult to explain what phyſical or mechanical condition the different ſtates of ſleep and waking conſiſt in, it is highly probable that theſe two ſtates do truly alternate with each other. That the ſtate of waking does neceſſarily induce the ſtate of ſleep, will be readily admitted; and it is equally probable that a certain time of ſleep does not only take off the ſtate of ſleep, but does alſo induce the condition neceſſary to the waking ſtate. If this is admitted with regard to natural ſleep, it will be readily allowed that the ſame means will alſo operate on the ſtate induced by narcotics, and will therefore at length put an end to it.

THESE are the conſiderations I can offer with reſpect to Sedatives in general: and what might be further attempted in this way will appear more properly from what is to be ſaid of the particular ſubſtances to be treated of under this title. And I begin with the conſideration of that ſedative, which of all others has been the moſt employed in medicine.

PARTICULAR NARCOTICS.

OPIUM.

THIS is procured by various means, from a ſpecies of poppy, which has properly got for its trivial name that of *Papaver Somniferum*. The botanical hiſtory of this plant, and the various means of procuring opium from it, have now been deſcribed in ſo many different books, that it is by no means neceſſary to repeat them here, or to determine by which of them the opium of our ſhops is particularly obtained; and I omit more readily any accounts of theſe, as it ſeems ſufficiently probable, that though they may give ſubſtances of different degrees of purity and power, they do not give a medicine of different qualities: and we ſhall now proceed to conſider that quality as it is found in the opium common in our ſhops.

IN the firſt place, we ſhall conſider its operation and effects as in general with reſpect to the animal œconomy; and afterwards conſider how theſe effects are varied and modified by the circumſtances of particular diſeaſes in which they are employed.

THE general effects of opium are very much the ſame with thoſe mentioned already as in common to narcotics; and indeed theſe were chiefly taken from the example of opium, though a more particular conſideration may ſtill be proper here.

THE general effect of narcotics, and perhaps every particular effect that has been taken notice of, we ſuppoſe to depend on the power of theſe ſubſtances in diminiſhing the mobility, and in a certain manner ſuſpending the motion, of the nervous fluid.

THIS we proſecute therefore more particularly with reſpect to opium; and the operation of this that ſeems firſt to be taken notice of, is its power of inducing ſleep.

THIS is a ſtate of the animal œconomy which ſpontaneouſly occurs in man, and perhaps in all other animals in their natural and healthy ſtate, once in the courſe of every diurnal revolution of the ſun.

IN man, in whom only we are particularly concerned, it is varioufly modified; but in its moſt natural and complete ſtate, it conſiſts in a total ceſſation of the exerciſe of all ſenſation and thought, and conſequently of all intellectual operation; and at the ſame time therefore of all exerciſe of volition, and of the motions of the ſyſtem depending upon this.

As we take it here for granted, that all exerciſe of ſenſe and voluntary motion depend upon the motion of the nervous fluid to and from the brain, we conclude that ſleep conſiſts in a ſuſpenſion of theſe motions. The cauſes of this ſuſpenſion have been variouſly aſſigned; but it does not appear neceſſary to conſider theſe ſeveral opinions here, as we ſuppoſe it to be demonſtrated elſewhere that it depends upon the nature of the nervous fluid itſelf, diſpoſed to the alternate ſtates of torpor and mobility.

WHAT is the phyſical or mechanical condition of the nervous fluid in theſe different ſtates, we do not pretend to explain; but it ſeems to be enough for our preſent purpoſe to ſay, that opium produces the ſame ſtate that occurs in natural ſleep. As in this, therefore, the motions from the extremities of the nerves to the ſenſorium ceaſe, we can readily underſtand how opium, producing this ſtate, can produce a ceſſation of all ſenſe of pain or other irritation ariſing from any part of the ſyſtem.

AT the ſame time, as in ſleep the exerciſe of will and every motion from the brain to the other parts of the ſyſtem entirely ceaſe; ſo opium can ſuſpend every motion from the brain into the voluntary organs, whether the motions in theſe appear in the form of convulſion or ſpaſm.

BUT not only do theſe powers of opium appear in the animal functions; but in ſo far as the other motions of the ſyſtem depend,

pend, as I preſume they do, on the conſtant energy of the brain, opium certainly diminiſhes the force of this, and thereby diminiſhes, and to a certain degree ſuſpends, all the vital and natural functions.

To proſecute the analogy of natural ſleep with that induced by opium, it is proper to obſerve, that natural ſleep occurs more or leſs readily as the cauſes producing it have been greater or leſs; and chiefly therefore according to the labours of the preceding day: but more certainly if thoſe irritations commonly ariſing from the exerciſe of the functions, or from external impreſſions, are more completely abſent; and particularly thoſe of the former kind, ariſing from interrupted digeſtion, from the earneſtneſs of mental occupations, and from the increaſed action of the ſanguiferous ſyſtem.

MAKING allowance for theſe circumſtances, the occurrence of ſleep is very much under the government of a periodical revolution which the ſyſtem is ſubjected to: and under the influence of this, it may occur at its uſual period, though the labours of the preceding day may have been much leſs than uſual; and it will only be prevented by ſome of the irritations juſt now mentioned, or others prevailing in the ſyſtem.

WHEN ſleep occurs in ſpite of the circumſtances that have a tendency to prevent it, it will be broken by thoſe irritations, that is, by the cauſes of watching frequently intervening; or if theſe do not proceed ſo far as to excite watching, they may render the ſleep incomplete, by producing only a partial interruption of thought: and as this exerciſe of thought, when it is partial only, muſt be irregular, ſo it muſt produce that incoherent and inconſiſtent thinking which we call dreaming.

ACCORDING to the degree of the cauſes, dreams may be mild, and perhaps agreeable; or, according to the violence of their cauſes, they may be more turbulent, and with more emotion produced. It appears that, even from moderate cauſes, they are different, and prove either cheerful or gloomy according to the tone of mind prevailing in the perſon affected; but why, from violent cauſes, they are generally of the frightful kind, I cannot explain.

SUCH are the different ſtates of natural ſleep: and when it is over the effects of it are alſo different, while there is either a ſenſe of eaſe from all the irritations which the ſyſtem was affected with before, and when the ſleep is ſaid to be refreſhing, or there remains ſome of thoſe irritations that had diſturbed their ſleep, and therefore give a deſire of its continuance.

WHETHER, without any ſuch irritations, the ſtate of ſleep does not give a diſpoſition to its continuance, I leave my ſpeculating readers to conſider: But, however they may determine, it will not affect the propoſition I maintained above, that the ſtate of ſleep induces the ſtate fit for watching; ſince it is evident that a ſtate of ſleep ſubſiſting for ſome time induces a ſtate of the ſyſtem more ready to be affected by ſtimuli of all kinds.

ANALOGOUS to theſe different ſtates of natural ſleep, and of its conſequences, are the ſtates induced by opium. If the ſyſtem is tolerably free from irritation, opium induces a ſleep which would not have ſpontaneouſly occurred. Even though ſome irritations ſhould prevail, if theſe be moderate, opium, by diminiſhing ſenſibility, may induce ſleep, and will do it more or leſs according to the doſe employed. In ſome caſes, though the power of the doſe employed may not be ſufficient to induce ſleep, it may be able to take off, or at leaſt to diminiſh, the cauſes of reſtleſſneſs which had prevailed, and thereby give a tranquillity that, ſubſiſting for ſome time, is often found equal to the refreſhment of ſleep.

THERE are, however, caſes in which the irritations of the ſyſtem are too ſtrong to be overcome by the force of any moderate doſe of opium; and in ſuch caſes no ſleep is produced, and at the ſame time the conflict ariſing between the ſtimulant irritations and the ſedative power of opium, gives a farther irritation to the ſyſtem, which is often very hurtful to it. Such however is the force of the ſedative power of opium in inducing ſleep, that if the doſe be large it will overcome very ſtrong irritations; and it is to be remarked, that the conflict juſt now mentioned often ariſes from the doſe of opium being too ſmall, and when a larger would have prevailed over the irritations more entirely.

THE management of this, which is often a difficult matter in practice, muſt be directed by the nature of the irritations prevailing. It appears, that when the irritations are primarily and eſpecially applied to the brain, and not at all to the ſanguiferous ſyſtem, the force of opium may be employed very freely, and to any extent, and in a large doſe will always either take off the irritation entirely, or at leaſt for ſome time ſuſpend its operation; and from thence it appears, that in purely nervous caſes, opium may be employed in very large doſes with great ſafety.

BUT I have obſerved above, that narcotics, and particularly opium, in its firſt operation, often irritates the ſanguiferous ſyſtem, and excites the force of the circulation. And, however we may diſpute about the cauſes of this, the fact is certain, and that this in a certain degree gives opium the powers of a cordial and exhilarant.

hilarant. On this occaſion, it is to be obſerved, that though the action of the ſtimulant ſhould not entirely prevent the ſedative power, it often puts it off for ſome time, to give what we may call the intermediate ſtate of ebriety; which, according to the balance between the ſtimulant and ſedative power, may appear more or leſs, or may ſubſiſt for a longer or ſhorter time, and may therefore more particularly explain the operation of opium in different perſons and caſes.

The conſideration of the ſtimulant power of opium will particularly explain why, in perſons in whom the ſtimulant power is conſiderable, the effects of a moderate doſe of opium, inſtead of inducing ſleep, may, by the increaſed action of the heart, appear to prevent it; and this probably may alſo be a frequent cauſe of opium's not inducing ſleep. It will alſo be obvious, that in any caſe when the irritations already prevailing in the ſyſtem, and preventing ſleep, depend upon an increaſed action of the heart and arteries, the addition of the ſtimulus of opium, more ready to take place in ſuch caſes, muſt certainly prevent ſleep, with all the bad conſequences of the conflict above mentioned. In many caſes, however, the ſedative power does prevail, and at length induces ſleep; the ſtate of which ſleep and its effects may be underſtood from what is ſaid above.

If the ſedative power of opium prevails not only over the general energy of the brain, but alſo over its exertion in increaſing the action of the heart, the effects upon the whole may perhaps be ſalutary; but if the irritation of the heart either continues after the action of the opium has ceaſed, or be then, from that very action, more eaſily renewed, the effects may certainly be pernicious.

It appears clearly, that the ſtimulant and ſedative powers of opium operate at one and the ſame time; and in no inſtance more remarkably than in that of opium proving powerfully ſudorific. The increaſed action of the heart, however excited, has a tendency to produce ſweating; but every body knows that it is difficult to produce ſweating by the power of medicines purely ſtimulant, and at all times opium has been found to be the moſt effectual of all ſudorifics. This by ſome may be aſcribed entirely to its ſtimulant power; but it is highly probable that the ſedative power, concurring at the ſame time, by relaxing the extreme veſſels, renders the ſweating a more certain effect, and more conſiderable in its degree.

Are not the ſweatings which often occur in natural ſleep, and particularly the colliquative ſweat in hectics, analogous to this, as depending upon an irritation and weakneſs of the extreme veſſels concurring together?

Before I finiſh the operation of opium in general, it is proper for me to conſider what changes it may produce in the ſtate of the fluids. It has been very commonly imagined that opium rarefies the blood; but I can find no foundation for this. In many inſtances it produces its effects on the nervous ſyſtem while it is yet in the ſtomach, and before it can be ſuppoſed to have reached the maſs of blood, and often before it appears to increaſe the action of the heart. But even ſuppoſing ſome portion of it to be introduced into the blood-veſſels, whilſt it is not alleged that it acts as a ferment, we truſt to the general principle, that no kind of matter applied in ſmall proportion can have any conſiderable effect upon the mixture of a much larger maſs.

BY an argument therefore *à priori*, I conclude that opium does not rarefy the blood. It is, however, alleged as a fact that it does ſo; but we maintain that the ſymptoms which are ſuppoſed to be in proof of this may be owing only, or entirely, to the increaſed action of the heart and arteries, which will often give ſuch appearance without any change in the ſtate of the blood. And if it be further alleged, that after the uſe of opiates the veſſels are found in a more turgid ſtate, we are ready to admit the fact, but are diſpoſed to impute this to the ſlower motion of the blood in that caſe produced, by the weaker action of the extreme veſſels giving occaſion to the accumulation of it in the larger; and that this will appear eſpecially in the veſſels of the head, and in the ſyſtem of the vena portarum; in both of which the blood is more liable to ſtagnate in every caſe of languid circulation.

WITH reſpect to the fluidity of the blood in conſequence of the frequent uſe of opium and other narcotics, we may admit the fact; but we ſuppoſe it to be in conſequence of a ſtate of the circulation rather than of the effect of mixture: The experiments adduced in proof of the latter opinion being made on blood drawn out of the veſſels, and with ſuch a proportion of mixture as cannot by any means be applied to them while they are in circulation, and therefore that ſuch experiments do not afford any concluſion.

HAVING now conſidered the effects of opium upon the human ſyſtem more generally, I proceed, in the next place, to conſider how theſe general effects are ſuited to the circumſtances of particular diſeaſes: And firſt, of its employment in continued fevers.

THE nature of continued fevers was, in former times, little underſtood by phyſicians; and I flatter myſelf that I have ſomewhat advanced the ſtate of our knowledge on this ſubject, though I muſt allow that there are ſeveral circumſtances of continued fevers not yet ſufficiently explained and underſtood. For the general doctrine, ſo far as I have been able to deliver it, I muſt refer the reader to my other writings, and muſt confine myſelf here to thoſe parts of the doctrine which relate to the uſe of opium in continued fevers.

To this purpoſe we are diſpoſed to think, that almoſt all our continued fevers ariſe from contagion, or from certain corruptions of human effluvia proving ſuch; and it is highly probable that thoſe contagions, or matters ſimilar to them, act as ſedative powers, and, applied to the human body, produce a debility, which both induces the fever and ſubſiſts through the whole courſe of it, proving the circumſtance from which the danger of the fever chiefly ariſes. In this view of the matter, opium, as a ſtimulant to the heart and arteries, may be conſidered as a principal remedy in fevers; and as ſuch we are diſpoſed, with the moſt part of our preſent practitioners, to conſider it: But that it is univerſally ſuch, and in every circumſtance of fever proper, we are very far from thinking.

IN very many of the fevers of this climate, there appears in the beginning of them to be more or leſs of an inflammatory diatheſis in the ſyſtem; and during this ſtate I hold, and have often ſeen, the uſe of opium to be extremely hurtful. It does not then either induce ſleep or relieve pain, but aggravates the inflammatory ſymptoms, and often determines to particular inflammations, which prove afterwards fatal.

In different fevers this inflammatory ſtate is in different degrees, and of different duration. In ſome caſes of the moſt powerful contagions, it may appear very little, and ſuch caſes may very poſſibly admit the early uſe of opium; but in moſt of the caſes in which cold ſo frequently concurs in the production of the fever, we ſuppoſe that ſuch inflammatory ſtate commonly ſubſiſts for the firſt week of the diſeaſe; and therefore, for that ſpace of time, we hold opium to be a dangerous, and at leaſt an ambiguous remedy.

As the diſeaſe advances, the inflammatory ſtate generally diſappears in the ſecond week, and the ſymptoms of debility become more evident. In this condition opium may be employed, and more or leſs as the ſymptoms of debility and irritation are more diſtinctly apparent; but even in this ſecond ſtage, it is an ambiguous remedy; and if it increaſes delirium, and does not readily induce ſleep, it may be very hurtful, and is therefore to be employed with great caution.

In this advanced ſtate of fevers, there is a circumſtance which occurs that we are aſſured of as a fact, though we cannot well explain it. The cauſe of fevers gives an irritation to the brain, which is not of the inflammatory kind, but produces convulſive motions of the limbs to a conſiderable degree; and to this irritation it is that we impute the ſubſultus tendinum ſo much taken notice of as occurring in the advanced ſtate of fevers.

The ſame irritation alſo frequently produces a delirium; which, as not of the phrenetic and inflammatory kind, we name the Maniacal. To remove theſe effects of irritation I find opium to be a ſovereign remedy; and it may not only be employed freely, but muſt commonly be given in large doſes, and theſe alſo repeated every eight hours, unleſs ſleep and a remiſſion of the convulſive motions and delirium ſhall allow of longer intervals. For ſome time, however, in the advanced ſtages of fever, though theſe ſymptoms, by the uſe of opium, may be much abated, they are liable to recur, unleſs they are obviated by the repetition of the opiate.

THERE is ſtill another circumſtance in the advanced ſtage of fevers that on this occaſion requires to be taken notice of. Though the moſt part of our fevers ariſing from contagion may have little general inflammatory diatheſis accompanying them, and be on the contrary attended with much debility, there occurs however, from cauſes not eaſily aſſigned, ſome topical inflammation of the brain, which has frequently appeared upon diſſection, after fevers of the moſt nervous or putrid kind. Theſe topical inflammations, and the delirium depending upon them, do not admit of opium, and all their ſymptoms are much aggravated by it. The exiſtence, however, of ſuch topical inflammation, is not always eaſily aſcertained; and ſome ſuffuſion of the eyes is not always a certain proof of it: but we can give no better directions for the management of this matter than thoſe given by Sir John Pringle with reſpect to the uſe of wine in the jail fever.

THESE are the remarks I have to offer on the uſe of opium in continued fevers. Many are more fond of a more free uſe of it than had been common before, and have believed that this was introduced by a certain noted teacher and author; but I aſſert, that I myſelf was the firſt who freely and largely employed opium in fevers, under certain reſtrictions indeed, which, neglected by other practitioners, have occaſioned much miſchief.

IN the cure of intermittent fevers, opium, or ſome of thoſe compoſitions of which it was the chief ingredient, were very much employed by the ancients; but ſince the uſe of Peruvian bark has been introduced, opium has been leſs employed, and only by perſons who were prejudiced againſt the bark. Mr BERYAT of the Academy of Sciences, without knowing any thing of what had been done before, has endeavoured to recommend the uſe of opium; but without ſhowing any underſtanding of the nature of the diſeaſe, or of the remedy he propoſes to be employed. He has been therefore, ſo far as I know, little followed by any practitioners ſince that time.

To judge properly of its uſe, we muſt attend to the nature of the diſeaſe, which I hope is better underſtood now than it was before. It appears to me clearly, that the recurrences of the paroxyſms of intermittent fevers depend upon the recurrence of a ſtate of debility, and that this is to be prevented either by the uſe of tonics or ſtimulants, which may excite the action of the heart and arteries, and ſupport that excitement till the period of acceſſion is over.

FOR this purpoſe, various means of exciting fever and ſweat have been employed; and there is perhaps no medicine that can be more effectually employed for that purpoſe than opium. It appears that Dr BOERHAAVE's ſudoriferum antipyreticum rarofallens derived its chief virtue from the two grains of opium which it contained, and which determined it to act as a ſudorific. Opium alone has been employed, by being given an hour or two before the time of acceſſion, and has prevented the return of a fit without exciting ſweat, and merely as a ſtimulus and antiſpaſmodic; but the conſequences of this, as marked by Baron STORCK and others, have been ſometimes bad: and it ſeems that the ſafe and more certain practice will be, to direct opium to operate by ſweating.

We need hardly ſay here, that almoſt every practitioner has found it uſeful to join opium to Peruvian bark, or other tonics, in the cure of intermittents. Not only in correcting the purgative quality of the bark, or other tonics which ſometimes take place, but even where no ſuch purgative quality is to be apprehended, we are certain that a certain quantity of opium, joined with the bark, makes it ſit eaſier upon the ſtomach than with certain perſons it would otherwiſe do; and that a portion of it, joined with two or three doſes of the bark, which are given immediately before the time of acceſſion, enables it, in leſs quantity than it would otherwiſe do, to prevent the return of paroxyſms.

A PARTICULAR uſe of the bark in intermittents has not long ago been propoſed and practiſed by Dr LIND of Haſlar, which is the giving opium in the time of the hot ſtage of the paroxyſms. As I have had no experience of this practice, I cannot either recommend it, or offer the ſuſpicions I have of its being improper.

We proceed, in the next place, to conſider the uſe of opium in inflammatory diſeaſes, in which the practitioners of almoſt all ages have declared it to be hurtful; and we ſhould be much ſurpriſed if any perſon engaged in practice for any length of time had not found it frequently to be ſo. The reaſon of it is alſo obvious; for, if inflammatory diſeaſes conſiſt in an increaſed action of the heart and arteries with a phlogiſtic diatheſis, which cauſes and ſupports this increaſed action, it is highly probable that every ſtimulus applied to the ſyſtem muſt do the ſame, and thereby aggravate the diſeaſe; but opium, on many occaſions, as we have ſaid already, is a ſtimulant power; and whoever denies this, as ſome in writing have done, appears to deny and miſrepreſent facts admitted by every body elſe. For my part, I conclude with the utmoſt confidence, that opium, in general, is hurtful in all inflammatory diſeaſes, and diſpoſed to increaſe the phlogiſtic diatheſis of the ſyſtem; and as all practitioners are agreed that blood-letting affords the moſt effectual means for the cure of that diatheſis, ſo we are perſuaded of the propriety of Dr YOUNG's general rule, that opium is improper in all thoſe caſes in which blood-letting is neceſſary.

BUT I muſt allow, as he does, that there may be exceptions, or circumſtances in certain inflammatory diſeaſes, that may admit, or perhaps require the uſe of opium. Such are thoſe caſes in which the inflammatory ſtate ariſes from irritation in a particular part producing ſpaſm and ſupervening inflammation. Thus, in caſes of jaundice, I have found a biliary ſtone, in paſſing the biliary ducts, give ſuch an irritation as to produce a conſiderable degree of inflammatory ſtate in the ſyſtem; and though I have found it neceſſary, for moderating this, to employ blood-letting, yet, as I conſidered the paſſage of the ſtone to be chiefly interrupted by a ſpaſmodic conſtriction of the ducts, I have employed opium for taking off this with great advantage.

SIMILAR circumſtances have frequently occurred in the caſe of urinary calculi paſſing the ureters, in which I have found it neceſſary to employ opium and blood-letting at the ſame time.

IN like manner, as opium is uſeful in moderating excretions; ſo where the irritation occaſions an increaſe of theſe excretions, which is attended with affections which irritate the whole ſyſtem, opium becomes eſpecially uſeful. Hence it becomes ſo generally uſeful in catarrhal affections, and the cough attending them; and probably it is this analogy that has brought the uſe of opium to be frequently employed in pneumonic inflammations. It is poſſible that there may be caſes of ſuch inflammations wherein the opium may be more uſeful in taking off the cough, than hurtful by aggravating the inflammatory ſtate of the ſyſtem: but I have hardly met with ſuch caſes; and even in the recent ſtate of catarrhs from cold, I have found the early uſe of opium manifeſtly hurtful: and in caſes of pneumonic inflammation I have always found it to be very much ſo, if exhibited before the violence of the diſeaſe had been moderated by repeated blood-lettings.

WHEN that indeed has been done, I have found the opium very uſeful in quieting the cough; and I have hardly ever found it hurtful by ſtopping expectoration. It may ſuſpend this for ſome hours; but if the glands of the bronchia have been duly relaxed by bleeding and bliſtering, the expectoration after the uſe of opiates always returns with more advantage than before. The mucus which had iſſued before had been poured out from the follicles in an acrid ſtate; but, by being made to ſtagnate, it becomes milder, and is diſcharged in what the ancients called a Concocted State, with more relief to the lungs.

ALTHOUGH we are well perſuaded that opium, when it does not procure ſweat, is always hurtful in inflammatory diſeaſes; yet I am ready to admit, that when it is directed to procure ſweat, it may be ſo managed as to take off the inflammatory diſpoſition of the ſyſtem, and thereby to cure the moſt part of inflammatory affections. This we certainly learn from the preſent practice in acute rheumatiſm, which is often cured by a ſweat excited by DOVER's powder. We conſider the diſeaſe to be purely of the inflammatory kind, and attended with every mark of inflammatory diſpoſition; and therefore, when opium, in this diſeaſe, is given for the purpoſe only of relieving pain and giving ſleep, we have found it conſtantly hurtful; but we have always found, that ſweating with DOVER's powder was the moſt effectual means of taking off the whole of the diſeaſe.

BEFORE diſmiſſing the conſideration of the uſe of opium in inflammatory diſeaſes, I muſt obſerve that there is a certain ſtate of theſe in which I judge it to be not only admiſſible, but often very uſeful. This is in the ſuppurating ſtate of inflammation; and, as ſoon as a determination to this has taken place, we ſuppoſe the phlogiſtic diatheſis of the ſyſtem to be very much taken off, and therefore that the pain of ſuppuration may be ſafely relieved by opium, as we are at the ſame time perſuaded that opium promotes the proceſs of ſuppuration.

THE next ſet of diſeaſes in which I am to take notice of the uſe of opium, are the Exanthemata: and I begin with obſerving, that as, in the whole of theſe it may be ſuppoſed there is an acrimony diffuſed over the whole ſyſtem, and giving ſome irritation to it; ſo we are of opinion, that opium, by moderating this irritation, may in general be uſeful, and that therefore it is often more admiſſible than their other circumſtances might ſeem to allow.

BUT, to be more particular, the uſe of opium in the ſmallpox has, ſince the time of SYDENHAM, been very much ſpoken of. In the inflammatory ſtate of the eruptive fever, I have always found opium to be hurtful; but as ſoon as the diſeaſe has taken a determination to ſuppuration, I have always found it employed with advantage. As I had occaſion to practiſe in this diſeaſe long before the practice of inoculation became common in this country, I always found the practice of SYDENHAM, in giving an opiate once or twice a-day, to be extremely uſeful, eſpecially when, at the ſame time, much coſtiveneſs was prevented by the uſe of laxative glyſters. Since the practice of inoculation became more common, and that by the ſeveral means employed few puſtules are produced, I hold the employment of opiates to be unneceſſary and ſuperfluous; but when it happens, even after inoculation, that a numerous ſet of puſtules are produced on the face, I ſtill hold the employment of opiates to be extremely proper: and when, either in conſequence of common infection or of inoculation, a confluent ſmall-pox is produced, which is always attended with a low and putrid fever, I hold opium to be one of the moſt effectual means of ſupporting the vigour of the ſyſtem, and of producing as much of a kindly ſuppuration as the nature of the diſeaſe will admit of. In ſhort, I hold opium to be a very uſeful medicine in various circumſtances of the ſmall-pox; but I would not aſſert its abſolute utility to be ſo great as the late Dr de HAEN, from his enmity to inoculation, has been led to maintain.

THE affinity that was ſo long ſuppoſed to take place between the ſmall-pox and meaſles, formerly led practitioners to transfer the practice found uſeful in the one to that of the other; and I ſuſpect that even Dr SYDENHAM was under this influence in recommending ſo ſtrongly as he has done the uſe of opiates in the meaſles.

THE meaſles, however, is purely, and often ſtrongly, an inflammatory diſeaſe, with a ſtrong tendency to pneumonic inflammation; and I believe that the moſt part of practitioners find blood-letting to be the moſt certain means of obviating the fatal conſequences of this diſeaſe. In many caſes therefore of meaſles, before bleeding had been duly employed, I have found opium to be not only ineffectual, but manifeſtly hurtful. It is true indeed, that the meaſles are very conſtantly attended with a cough, for which the only certain remedy is opium: and as this ſymptom is not only ſevere, but may be ſuppoſed to aggravate the diſeaſe, the practitioner has a ſtrong temptation to employ opium; and I am of opinion that it may be employed more freely than the inflammatory nature of the diſeaſe might ſeem to admit of. I would however have practitioners, from what I have ſaid above on the uſe of opium in pneumonic inflammation, and now on the preſent ſubject, be as much as poſſible reſerved in the uſe of opium in the meaſles, till the violence of the inflammatory ſtate be taken off by bleeding and other antiphlogiſtic meaſures.

WITH reſpect to the uſe of opium in other exanthemata, I have little to ſay. When the ſimple ſcarlatina, and even the ſcarlatina anginoſa, is purely inflammatory, without any tendency to a putrid ſtate, I judge opium to be an unneceſſary remedy; and when the ſcarlatina anginoſa is of the putrid kind, I am perſuaded that opium may be pernicious.

THE next order of diſeaſes to be taken notice of in which opium may be employed, is that of hæmorrhagies. From the manifeſt power of opium in reſtraining evacuations, an analogy has transferred the uſe of it to hæmorrhagies, and both materia medica and practical writers have commended its uſe in ſuch caſes; but we are perſuaded that there is much fallacy in the teſtimonies that have been given of its good effects. We are well perſuaded, that every active hæmorrhagy is accompanied with a phlogiſtic diatheſis of the ſyſtem; of which we have juſt now ſaid enough to ſhow, that in ſuch caſes opium is generally hurtful, and I have had ſeveral occaſions in active hæmorrhagies to obſerve its being ſo. If opium therefore is ever admiſſible or uſeful in ſuch caſes, it muſt be in thoſe in which the hæmorrhagy is occaſioned and ſupported by a particular irritation. Thus, in a hæmoptyſis, where the blood comes up without coughing, or when the cough attending it only ariſes in conſequence of blood being poured out into the bronchia, as in caſes of hæmoptyſis from external violence, opium is of no ſervice, and often does harm. But there are caſes in which the hæmoptyſis is occaſioned by coughing, and appears only in conſequence of the returns of coughing: in which caſes opium may, and has been of ſervice.

IN the mænorrhagia which happens to women who are not pregnant, I have not found opium of ſervice: but in the caſes of abortion and of child-bearing, the hæmorrhagy very often depends upon ſpaſmodic affections; in quieting of which opium may be highly uſeful.

THERE is no diſeaſe in which opium has been more frequently employed, or found more uſeful, than in catarrhal affections. Theſe very often depend upon an undue balance of the ſyſtem, that is, upon a languid perſpiration, neceſſarily producing a more copious determination to the lungs; and this, as pouring out a mucus, is attended with much coughing. In many perſons this is habitual, or is readily renewed upon every ſlight application of cold; and in ſuch caſes and perſons opium is a ſovereign remedy. Whenever, therefore, there is little fever and much coughing, it may be employed very freely, that is, in doſes which have ſedative effects without heating the ſyſtem. The peculiar delicacy and irritability which occurred in Dr G. YOUNG, does not allow of his experience being admitted in forming any general rules.

THE remarks I have now made relate eſpecially to habitual catarrhs; but there is a catarrh ariſing occaſionally only from a ſtrong application of cold, almoſt always attended with a phlogiſtic diatheſis of the ſyſtem, and probably with a more or leſs inflammatory ſtate of the mucous glands of the bronchia. Such a diſeaſe is to be cured by blood-letting, and an antiphlogiſtic regimen; and the early uſe of opium, by confirming the inflammatory ſtate, has proved very hurtful. What I have ſaid above upon the management of the cough in caſes of pneumomonic inflammation, is entirely applicable here, and ſhould correct an abuſe that has been too common and very miſchievous.

ANOTHER profluvium in which opium has been much employed, is the dyſentery; the nature of which, till very lately, has been very little underſtood. If I am right in the pathology I have elſewhere endeavoured to eſtabliſh, it will be obvious, that if the preſent practice of the frequent uſe of gentle laxatives be the moſt effectual meaſure, it will be equally evident that opiates muſt be commonly hurtful; and notwithſtanding the urgency of pain, it is at beſt a very precarious remedy, and to be avoided as much as poſſible. This, however, ſeems now to be ſo well underſtood by our practitioners, that there is no occaſion for my inſiſting longer on it here.

I HAVE now conſidered the uſe of opium in all thoſe caſes in which it is moſt nice and difficult, that is, in all the various diſeaſes of the febrile kind; and with reſpect to others, our work will be more eaſy.

IN the comatoſe diſeaſes, it is obvious that opium can hardly in any caſe be admiſſible. In ſome caſes of palſy, attended with convulſive motions, I have known it employed, and with

ſucceſs,

ſucceſs, in relieving theſe motions, but manifeſtly, at the ſame time, aggravating the primary diſeaſe.

IN dyſpepſia and hypochondriaſis, there often happens pains and ſpaſmodic ſymptoms, which may be, and for the moſt part are, relieved by opium. It is accordingly often employed, and it is not eaſily withheld from ſuch patients; but I have always found the frequent uſe of opiates in theſe diſeaſes extremely pernicious.

IT is by preſerving the mobility of the energy of the brain, eſpecially in ſpaſmodic affections of an idiopathic kind, that opium has diſcovered its great powers. In the moſt violent and obſtinate diſeaſe of this kind, the tetanus, opium, though often inſufficient, has however been the moſt effectual remedy; and it appears that, whatever other remedies have been propoſed and alleged to be uſeful, hardly any of them have been ſo but when opium was at the ſame time employed. But I ſay no more on this ſubject, as I expect the enquiries that the Societé Royale of Paris are now engaged in will give us ſome more light on this ſubject: and I muſt alſo refer to the works of that learned Society for our beſt inſtruction on the uſe of opium in the hydrophobia.

IN various convulſive affections of the limbs, not accompanied with any ſtupor, and therefore not to be conſidered as epileptic, we have frequently found opium of ſervice; but it is not always ſo: And as I cannot always in different caſes aſſign the cauſes, or diſtinguiſh them by different circumſtances; ſo I cannot determine the caſes in which it is eſpecially proper.

THERE is a caſe which I think may be diſtinguiſhed from all others, which is generally known under the title of Chorea Sti. Viti. Neither the pathology or practice in this diſeaſe is well agreed on among phyſicians; and we cannot enter into the diſcuſſion here; but can ſay, from a good deal of experience, that opiates have been very generally uſeful in the cure of it.

ON this ſubject of convulſive diſeaſes, the great queſtion with regard to the uſe of opium has occurred with reſpect to epilepſy; and it has been variouſly determined by different authors. The pathology of the diſeaſe is in many reſpects obſcure; but we can clearly enough perceive that it ariſes from different conditions of the ſyſtem; and ſo far as we can diſcern and diſtinguiſh theſe, we may make ſome attempts towards aſcertaining in what caſes of epilepſy opium may be hurtful, and in which it may be uſeful.

To this purpoſe, we can obſerve that it may be produced by large hæmorrhagies, or other cauſes of great debility: but as I have hardly ever met with caſes of this kind, I cannot ſay how far opium may be uſeful in them.

MUCH more frequently do we meet with epilepſy connected with a plethoric ſtate of the ſyſtem: and in all ſuch caſes I am of opinion with the moſt part of practitioners, that opium is extremely hurtful. So far does a plethoric ſtate appear to me to diſpoſe to this diſeaſe, that I am of opinion with Dr CHEYNE, that epilepſies have been more frequently cured by a low diet than by any other means. It is here to be obſerved, that epileptic fits very frequently occur from an occaſional turgeſcence of the blood in the veſſels of the brain: and from frequent trials, I know that opium will not prevent ſuch fits, but if exhibited will bring them on with more violence.

THEY are the epilepſies ariſing from irritation applied to the nervous ſyſtem in which opium promiſes to be uſeful; and when the return of ſuch fits are anywiſe periodical, or nearly ſo, opium given a little before the times of acceſſion, has been often uſeful in preventing the recurrence. In many inſtances, however, the returns of epilepſy are irregular; and in ſuch caſes, the frequent uſe of opium, either by producing an occaſional turgeſcence of the blood, or by increaſing the mobility of the ſyſtem, is often very hurtful.

As inſtances of epilepſy depending upon irritation applied to the nervous ſyſtem, I conſider all thoſe depending upon an *aura epileptica* to be ſuch: and in ſeveral caſes of this kind, where the times of acceſſion could be foreſeen, and even when the ſymptoms announcing it had come on, I have found opium an effectual remedy.

THE late Dr de HAEN has given us what ſeems to be a ſingular caſe of epilepſy, as occurring only in the time of ſleep, and when the recurrence of the fits was prevented by avoiding ſleep: But at the ſame time this very diſeaſe was cured by the uſe of opium. This, as I have ſaid, may ſeem ſingular; but it is not ſo much ſo as might at firſt ſight appear: for perhaps the greateſt number of the caſes of epilepſy occur during the night, and during ſleep. In ſeveral ſuch caſes I have now frequently found an opiate, given at bed-time, prevent their return.

I HAVE thus treated of the uſe of opium in the ſpaſmodic affections of the animal functions, and of thoſe of the vital; I have to mention only thoſe of the heart in palpitation, and thoſe of the lungs in aſthma and chincough.

PALPITATION is generally a ſymptomatic affection; and ſo far as it depends upon ſpaſmodic affections, if the primary diſeaſe admits of opium, the ſymptom of palpitation may be cured by it alſo.

IN the caſe of aſthma, when the diſeaſe depends, as it often does, upon occaſional turgeſcence of the blood in the lungs, opium can hardly be employed with ſafety; but when it depends upon other irritations, and is purely of the ſpaſmodic kind, opium may be employed both to prevent and to moderate fits with great advantage. Even when the diſeaſe is of the catarrhal kind, if it be fit to employ opium to relieve the cattarh, it may likewiſe be employed to relieve the aſthma depending upon it. But I muſt conclude by remarking, that in both the ſpaſmodic and catarrhal aſthma, I have frequently employed opium in moderating the diſeaſe; but have never found it to prove an entire cure of it.

WITH reſpect to the chincough, we have to obſerve, that in the firſt ſtage of it, and eſpecially when that is attended with fever and difficulty of breathing, opium has always appeared to me very hurtful; but when the diſeaſe has ſubſiſted for ſome time, and is in what I call its ſecond ſtage, and when the fits come moſt frequently in the night-time, I have found opium of great uſe; and as I judge, it has often contributed to put an end to the diſeaſe.

IN the ſpaſmodic affections affecting the natural functions, opium may have much employment. In the pyroſis, frequent in this country under the name of the Water-braſh, and frequent in moſt countries of Europe, as a tranſitory illneſs, has been little taken notice of by phyſicians; but it is a painful diſorder, and a relief from it is often demanded. We have found nothing that gives that relief excepting opium; but this relieves only the preſent fit, and contributes nothing to preventing returns of it.

IN colic, the employment of opium is not exactly agreed on. It will pretty certainly relieve the pain for ſome time; but if the colic has been brought on, or is attended by coſtiveneſs, it will certainly confirm the diſeaſe and interrupt the operation of the purgatives, which are abſolutely neceſſary to the cure of it. Opium, however, is certainly ſuited to the cure of every ſpaſmodic affection; and if it can be employed ſo as not to interfere with the operation of purgatives, it may as an antiſpaſmodic even favour the operation of theſe, and contribute to the cure of certain caſes of colic. For this purpoſe, ſome practitioners have exhibited the opium and the purgative at the ſame time; but this has been ſeldom found to anſwer, and it has always appeared better, in the urgency of pain, to exhibit the opiate by itſelf; and in four, five, or ſix hours after, when the power of it was ſomewhat diminiſhed, to exhibit the purgative. In this manner of managing, it is commonly neceſſary to employ a purgative of a powerful kind, and one that commonly operates ſoon after its exhibition; and theſe conſiderations will, on the one hand, exclude the employment of aloetics, and, on the other, recommend the oleum ricini.

IN affections of the alimentary canal, of a nature contrary to that of colic, that is, where the action of the canal is preternaturally increaſed, as in vomiting, cholera, and diarrhœa, opium is a more undoubted remedy.

VOMITING is commonly a ſymptomatic affection, from very various cauſes; and in many caſes cannot be cured by opium: but the diſtinction of theſe caſes cannot be entered into here; and I have only to obſerve, that there are more caſes of it than is commonly imagined to be relieved by opium properly employed.

IT is common with practitioners to exhibit the opium by the mouth; and it is often in ſuch caſes immediately rejected again by vomiting, without having any effect in relieving the diſeaſe; which muſt always render the practitioner uncertain to what quantity it may be neceſſary to repeat the opiate. In all ſuch caſes, when the vomiting is not immediately ſtopped by the opiate given, and this is rejected by vomiting, it is extremely improper to repeat it in the ſame manner; and a much ſurer meaſure is to throw the opium, joined with a ſmall bulk of a mild liquid, into the anus; and when thus thrown in, in ſufficient quantity, it will as certainly ſtop the vomiting as if it had been thrown into the ſtomach itſelf.

IN cholera, the employment of opium, as directed by SYDENHAM, is ſo well underſtood that we need not ſay any thing of it here: and I go on to ſpeak of its uſe in diarrhœa, in which it has not been ſo frequent as we judge it ought to be.

As diarrhœa ſeems always to depend upon an increaſed action of the inteſtines, ſo, except in a few ſingular inſtances in which opium proved purgative, we have found it very univerſally to have the power of diminiſhing, and for ſome time ſuſpending, the action of the inteſtines; and therefore very univerſally of uſe in the diarrhœa. This indeed may ſometimes be a ſymptomatic affection, and therefore not to be entirely cured by opiates; and ſometimes the diſeaſe may depend upon an acrimony which muſt be evacuated in order to the entire cure of the diſeaſe. But ſtill in moſt caſes it ſeems to be ſafely employed: for as its operation is not very durable, it will not long interefere with the uſe of other remedies that may be thought neceſſary; and it ſeldom happens that the temporary ſuſpenſion of the diarrhœa is of any bad conſequence. In many caſes we have found purgatives to be very hurtful, and the diſeaſe to be more quickly cured by the continued uſe of opium alone.

THERE is no diſeaſe in which opium has been more frequently ſpoken of as a remedy than in hyſteric affections; but there is nothing I find more difficult to treat of in a ſcientific manner.

THE term Hyſteria I would willingly confine to the affection which I have deſcribed under that title in my Firſt Lines; but moſt writers are diſpoſed to extend the meaning of it much farther, and to every unuſual feeling, or irregular motion, that ſeems to ariſe from a mobility of the nervous ſyſtem. To give any due limits to this idea of hyſteric, I find beyond the reach of my ſkill, and ſhall not attempt it here: and with reſpect to my preſent ſubject, can only ſay, that in hyſteria, as I would define it, and as generally affecting plethoric habits, and depending upon an occaſional turgeſcence of the genital ſyſtem, I hold opium to be an improper, and commonly a hurtful, remedy.

BUT, on the other hand, in all thoſe caſes of unuſual feeling and irregular motions, not depending upon a plethoric ſtate, but manifeſtly upon a mobility of the nervous ſyſtem, opium is a very certain remedy. Whenever therefore theſe ſymptoms are in exceſs, it may be employed, though it be difficult to ſet

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the proper limits to its uſe. There are caſes in which its tonic and antiſpaſmodic powers muſt be frequently repeated; but it is to be remarked, that wherever that neceſſity does not manifeſtly occur, the frequent uſe of it increaſes the mobility of the ſyſtem, and creates a ſeeming neceſſity that readily induces a habit, which again, conſtantly indulged, has a tendency to deſtroy the ſyſtem altogether.

IN the rabies canina, and in the moſt violent ſtate of it, the hydrophobia, opium has been employed; but the experiments reported have not been ſo many as to fix our judgment on this ſubject: and for what may be ſaid upon it, I muſt refer my readers to the labours of the learned and induſtrious Societé Royale of Paris, who have taken much pains, and employed the moſt proper means for aſcertaining the practice in this diſeaſe.

IN mania the employment of opium is nice and difficult. In the appendix to WEPFER's Hiſtoriæ Apoplecticorum, we have an account of mania being cured by large doſes of opium; and it may be true: but there is no ſuch account of thoſe caſes as might ſerve to ſpecify their peculiar character, ſo as to enable us to imitate the practice, whilſt we know pretty certainly that there are other caſes which do not admit of the ſame.

IN ſeveral caſes of mania we have employed opium, and in ſome have found it uſeful in moderating the violence of the diſeaſe; but in other caſes we have found it manifeſtly hurtful: and we have not had ſo many opportunities of treating the diſeaſe as to allow us to diſtinguiſh clearly the caſes in which it may be proper. We ſuppoſe there are many caſes of the diſeaſe depending upon an organic affection of the brain, in which no benefit is to be expected from opium; but there are certainly many other caſes in which, from their tranſitory nature, we cannot ſuppoſe any ſuch organic affection, and in which therefore opium may be admiſſible and uſeful.

IF we may ſuppoſe that ſuch caſes depend upon occaſional cauſes of excitement without inflammation, we ſhould judge opium to be a promiſing remedy; but probably it muſt be given in larger doſes than we commonly exhibit, and poſſibly in ſuch large doſes as BERNARD HUET actually employed. In ſome trials we have found it moderate the diſeaſe, and induce ſleep; but I have never puſhed it ſo far as to obtain an entire cure, becauſe I ſuſpected that in many caſes the diſeaſe approached ſo much to a phrenitis as to render the large uſe of opium very dangerous. We cannot indeed treat this ſubject with ſo much preciſion as were to be wiſhed; but other practitioners having more opportunities of practice, by conſidering what I have ſaid both here and above on the ſubject of delirium in fevers, may ſettle this matter more exactly.

THERE is now but one other diſeaſe in which the uſe of opium is to be mentioned; and with reſpect to which our opinion will be expected: this is the venereal diſeaſe, in which of late opium has been very much employed, and with various ſucceſs. We do not think it neceſſary to give an account of the different facts reported, and of the different opinions entertained, on this ſubject, as they are to be found in many books which are in every body's hands; and all that ſeems to be incumbent on me is to ſay what I have learned from my own experience, and from that of my fellow-practitioners in Scotland. From this we have not learned that opium has been alone a remedy for the venereal diſeaſe; and any experiments that we know to have been made, lead us to conclude, that it is never alone ſufficient for that purpoſe. But from almoſt every experiment made, we are well aſſured of its being of very great uſe in almoſt every circumſtance of the diſeaſe. It moderates and alleviates every ſymptom; and in many of them it will do this without the aſſiſtance of other remedies.

We are well perſuaded that it will almoſt in every caſe favour and expede the effects of mercury, either in removing ſymptoms, or in entirely curing the diſeaſe. We have only further to remark, that the opium in this caſe ſeems to operate by obviating the effects of the general acrimony in the ſyſtem; and this ſuppoſition explains both why large doſes of the opium are neceſſary, and why perſons bear theſe large doſes in this diſeaſe better than in many other caſes.

The effects of opium hitherto mentioned are for the moſt part ſuch as appear in conſequence of its being given by the mouth; but we have alſo had occaſion to ſay, that it may be introduced by the anus into the inteſtines: And it is proper to remark, that not only in the caſe of vomiting, but alſo in many others, it may be introduced in this way into the inteſtines, and in this way produce all the effects that have been mentioned of its being thrown into the ſtomach. In ſome perſons there is a peculiar irritability of the ſtomach with reſpect to opium, and from whence ſeveral diſorders ariſe, which are avoided by its being thrown into the rectum.

Some practitioners are of opinion, that ſome effects of opium upon the nervous ſyſtem in general, as headach and vomiting, which often appear in the morning after a doſe of opium had been thrown into the ſtomach over night, are not ſo ready to appear after its being thrown into the rectum; but this ſeems to depend upon the doſe in the latter caſe being weaker, either from the quantity employed, or from the leſſer ſenſibility of the rectum. This leads to obſerve, that the ſenſibility of the rectum is ſo much leſs than that of the ſtomach, that it is commonly neceſſary, when applied to the former, to employ at leaſt double the quantity of what would have been ſufficient for the latter.

In the application of opium to the rectum, it is neceſſary to introduce it in a liquid form, to avoid giving along with it any thing that may in the leaſt prove irritating to the rectum; and therefore a ſolution in water is the moſt convenient to be employed in this way. This is farther to be obſerved, that we are ſometimes diſappointed in this practice by the opiate glyſter's being rejected ſoon after it has been given. Hence it is as improper to throw it into the rectum in ſome caſes of diarrhœa and teneſmus, as we ſaid above it was improper in the caſe of vomiting to throw it into the ſtomach: but even though neither diarrhœa nor teneſmus be preſent, opiate glyſters are ſometimes rejected ſoon after they have been given. This perhaps may be owing to a peculiar irritability of the rectum in certain perſons; but we have found it commonly owing to too great a bulk of liquid being thrown into it; and therefore I adviſe that opiate glyſters be never made of more bulk than that of three, or at moſt four, ounces of liquid, and this, as we have ſaid, of a very mild kind. I find that three drams of gum arabic, diſſolved in three ounces of water, makes a proper and ready preparation for that purpoſe.

We muſt now add, that opium may be employed not only by being thrown into the ſtomach or into the rectum, but may alſo by being applied to the ſkin. In this caſe, as opium acts always firſt, as I have ſaid above, upon the parts to which it is immediately applied, ſo it may be often applied to the external parts with ſome advantage; and, by diminiſhing the ſenſibility of theſe parts, it may relieve the pain that happens to affect them. We find alſo, that opium operates not only on the parts to which it is immediately applied, but that, without being communicated to the ſenſorium, it operates to a certain extent on the nerves of the parts adjoining to that which it is more immediately applied to, in diminiſhing their ſenſibility, and thereby in relieving their pains. Thus a plaſter of opium applied to the temple has often relieved the toothach. In other caſes, when it is applied to the ſkin, whether it penetrates by inorganic pores to the viſcera of the abdomen, or if it only acts on the teguments, and particularly on the muſcles conſenting with the viſcera, we would not confidently determine; but we have certainly found the external application relieve the pains and ſpaſms of the ſtomach and inteſtines.

THE external application has been made under different forms, and I believe it may have effects either in the form of plaſter or poultice; but we are very certain that its effects are moſt conſiderable when applied in a liquid form. In this form it may be employed as diſſolved in water, wine, or ſpirit; but we preſume that it will always be moſt effectual when diſſolved in rectified ſpirit. This certainly moſt powerfully extracts the volatile part of opium, upon which its powers eſpecially depend; and this ſame volatile part may be preſumed to be the moſt readily penetrating, and therefore the moſt fit for external uſe.

AFTER thus endeavouring to aſſign the various powers and virtues of opium, we muſt, in the next place, ſay ſomewhat of its pharmaceutical treatment and exhibition. The former has been very various, and very little upon ſcientific grounds. We know of no means that can be employed in operating upon the opium alone that can improve its virtues. The volatile and active parts of it may be extracted from the other parts of its ſubſtance by rectified ſpirit of wine; but the tincture and extract made by this menſtruum has the ſame powers and virtues as the entire opium, and only differs by being brought into a ſmaller bulk. It is at the ſame time found, that theſe preparations are more offenſive to the ſtomach than the entire opium, and are therefore very little employed. The other menſtruums, as proof-ſpirit, wine, and water, that may be employed in extracting opium, do it all of them on much the ſame footing, extracting both the gummy and reſinous parts; ſo that the ſeveral tinctures do not differ but in proportion to the quantities employed. In all of them the qualities are the ſame as thoſe of the entire opium, with a very little difference from the ſolid or liquid form; the former, in certain caſes of irritability in the ſtomach, being readier to ſit upon it than the latter.

As opium may do ill as well as good, phyſicians have thought of correcting its bad qualities; but as they are not ſeparable from its good, the buſineſs of correction has been to no purpoſe. From the notion of the ancients with reſpect to its coldneſs, the correction has been attempted, by the joining with it aromatic and heating medicines, which was very anciently practiſed, and has in ſome meaſure been continued to the preſent time. Some practitioners are of opinion, that the addition of aromatics renders opium more agreeable to the ſtomach: and we dare not aſſert that this does not, in ſome caſes, take place; but we have hardly ever obſerved it, and we are very certain that the ſaffron and aromatics which are added to our thebaic tinctures, in the quantity they are employed, can neither do good nor ill. Both the colleges of London and Edinburgh have now omitted all additions to the tincture of opium, but both of them have retained the elixir paregoricum; which, either in the choice or proportion of its ingredients, I cannot perceive to have any other meaning than that of giving a variety of formula. Other attempts to correct opium have been equally fruitleſs; and the correction ſuppoſed to be obtained has amounted to no more than a weakening of its power, without producing any change in its qualities. Some means of weakening its power may be readily found, particularly ſuch practices as give occaſion to the diſſipation of its moſt volatile parts. Such is the making of the extractum thebaicum of the London College, in conſequence of a ſolution in water; and in the bringing this into the form of an extract, ſo much heat is employed as occaſions the diſſipation mentioned: but here I maintain there is no change in the qualities of the opium, and the only change effected conſiſts in the weakening of its power; ſo that two grains of this is neceſſary to produce the effects of one grain of the crude opium of the ſame quality that was employed in the preparation. Another means of weakening the powers of opium, is the application of acids, and we have found this very effectual: but it does not change the qualities; for, when given in a ſufficient doſe, it has all the ſame effects as the crude opium.

We know but one kind of addition that can be made to opium with the effect of modifying its operation; and this is the addition of emetics and neutral ſalts, which is done in making Dover's powder. In this ipecacuanha has been conſtantly employed; and it has been ſuppoſed that it has a ſpecific power of diminiſhing the power of opium, as in that powder larger doſes of opium can be employed than would be proper in the uſe of opium alone. This opinion, however, of the power of ipecacuanha with reſpect to opium, we cannot admit of, as we ſuppoſe that the large doſes of opium which are given in DOVER's powder become ſafe only becauſe, by the other ingredients, it is directed to ſweat. This we take to be the effect of ipecacuanha; not by any ſpecific, but by its emetic power, for we can obtain the ſame effect by antimonial emetics; for by theſe, as well as by ipecacuanha, we can be allowed to employ larger doſes of opium than we could of opium alone.

IT certainly belongs to a treatiſe on the virtues of opium, to explain and aſcertain the virtues of DOVER's powder; and I have mentioned ſome of them above, when ſpeaking of the uſe of it in intermittent fevers, in rheumatiſm, and in dyſentery; and I leave the farther uſe of it to be learned by an analogy from thoſe caſes. We have only to add, that wherever the DOVER's powder is to be employed, the effects and benefits of it will depend very much upon a proper adminiſtration, which we have very often obſerved to be neglected or miſtaken; and therefore we ſubjoin here what I have learned from much experience to be the moſt proper management of it.

THE powder is to be given in the morning, when the ordinary ſleep or the time of it is over. Sleeping is not incompatible with, but is commonly not favourable to, ſweating.

FOR ſecurity againſt cold, the patient is to be laid in woollen, that is, in a flannel ſhirt and in blankets, the bed-linen being entirely removed.

THE powder will be taken moſt properly by being made into a bolus with a little ſyrup, and ſwallowed in a wafer, that the taſte of it may not occaſion any ſqueamiſhneſs.

THE covering on the body may be only what the perſon has been uſed to ſleep in; but commonly it will be convenient to make ſome addition over the whole body, and always ſome conſiderable addition upon the feet and legs.

As the powder is ready to be thrown up by vomiting, no drink ſhould be taken into the ſtomach till ſome ſweat breaks out.

WHEN the ſweat begins to break out, the perſon may then take frequently, but at firſt in ſmall portions, ſome warm liquid, ſuch as thin gruel, weak ſage, or bohea tea; and of ſuch drinks he ſhould take frequently during the courſe of the ſweating.

WHEN the ſweat has broken out, if it does not extend freely to the legs and feet, ſome additional covering ſhould be laid over theſe parts, or to lay boiled bricks or bottles filled with warm water to the ſoles of his feet; for it is always proper to render the ſweating thus univerſal.

As the ſweat ſhould be carried on with as little heat and uneaſineſs to the perſon as poſſible, if he finds himſelf very warm and reſtleſs, the additional covering that was put upon the body, and even a part of that put upon the feet and legs, may be gradually removed.

IF the perſon bears the ſweating eaſily, it is of much conſequence to continue it for ſome length of time, and always, if poſſible, for twelve hours: then it will be allowable to let it ceaſe, by drying the body very well with warm towels, and ſhifting the body into dry flannels and blankets, and allowing him afterwards to put out his hands, and perhaps his arms, from under the bed-clothes; but he ſhould continue in flannel and blankets till next morning.

DURING the ſweating, inſtead of the drinks above mentioned, he may take frequently a weak ſoup, as chicken broth, or what we call beef-tea; and at his ordinary time of meals, he may take ſome dry toaſt with theſe broths; or if the ſweat does not proceed freely, and it is at the ſame time not attended with much warmth, he may, inſtead of the drinks mentioned, take frequently weak negus or white-wine whey.

IN the morning after this ſweating, the perſon may come out of bed, and put on his linen, and other parts of his ordinary dreſs, but ſhould keep his chamber, or at leaſt within doors, for the whole day after; and even for a day or two after that, he ſhould be very careful in avoiding his being expoſed to cold.

BY this adminiſtration I have found the DOVER'S powder a highly uſeful remedy.

WITH reſpect to the exhibition of opium, we have ſometimes found a ſmall doſe of it anſwer the purpoſe; as, in the gradual uſe of opium and of wine, the ſtimulant power is firſt exerted, ſo ſmall doſes are ready to prove ſtimulant rather than ſedative: but for obtaining the latter effect, it is commonly neceſſary to give a full doſe. This at a medium, for adults, is at leaſt one grain: And I am a little ſurpriſed at BERGIUS putting the mean doſe at half a grain, and at TRALLE'S telling us that he never goes beyond a grain. Both ſuch accounts ſhow me, that they do not uſe opium freely either in Sweden or Sileſia. We find it often ſafe and proper to give more than a grain; and whenever there is any irritation in the ſyſtem to be overcome, it is commonly neceſſary to go ſtill farther. In all caſes it may be proper to begin with moderate doſes; but where theſe do not anſwer the purpoſe, they muſt be repeated and increaſed till the deſired effect is obtained: and we very often find that they may be increaſed with ſafety to a very high degree. In a caſe of the gout in the ſtomach, I have by degrees gone to the doſe of ten grains twice a-day; and when the diſeaſe was overcome, the doſe of opium was gradually diminiſhed, till in the courſe of two or three weeks it was none at all; and in all this no harm appeared to be done to the ſyſtem. We frequently find, that when a ſtrong irritation is to be overcome, very large doſes may be given without procuring ſleep, or ſhowing any of theſe deleterious effects that in other caſes appear from much ſmaller quantities given. All this appears from the practice now well known in tetanus, mania, ſmall-pox, gout, and ſyphilis.

IN the uſe of opium, it is to be conſtantly obſerved, that in the caſe of irritation, when large and repeated doſes are neceſſary, that even the effects of ſuch doſes do not long continue; and therefore, that the repetitions muſt be made at no long intervals. We have frequently obſerved in ſuch caſes, that the effects of opium do not continue longer than eight hours; and that, after ſuch an interval, if the diſeaſe has not yielded to former exhibitions, a repetition becomes neceſſary. It is hardly requiſite to repeat here what we have ſaid above of narcotics in general, that opium is ſubjected to that law of cuſtom by which the force of impreſſions in which the body is paſſive becomes weaker by repetition; and that, when frequent repetitions are requiſite, it is always neceſſary to increaſe the doſe.

CICUTA.

THERE are many inſtances of the fallacy of experience in matters of the materia medica; but there is no inſtance in which it appears more ſtrongly than in the hiſtory of our preſent ſubject. Since Dr STORCK recommended it from his own experience as a moſt effectual remedy in many diſeaſes, it has been employed by many practitioners in every part of Europe; and taking in the whole of the reports we have had, I am ſtill at a loſs to ſay what are truly the powers and virtues of this plant. I am diſpoſed to think that the worthy Baron STORCK, from a partiality to his own diſcovery, and from much falſe information given in complaiſance and adulation to the rank he holds, has repreſented the virtues of hemlock as much greater than ever they were, or ever will be found to be; and many are the inſtances in which practitioners of the greateſt candour and diſcernment have found this medicine to fall much ſhort of the promiſes which Baron STORCK had given of it. For experiments directly contradictory to thoſe of Baron STORCK, we would not adduce the teſtimonies of a declared enemy, and of a man of the moſt difficult acceſs to all new opinions and remedies, the late Dr de HAEN: But we have no reaſon to reject the teſtimony of perſons not ſuſpected of partiality; and, in the particular caſe of cancers, we have the experiments of PETRUS AF. BIERKEN, as reported by BERGIUS, which aſſert, that the cicuta not only fails in the cure of cancers, but that it aggravates the diſeaſe, and haſtens on the fatal event of it. In the other inſtances ſeemingly contradicting the aſſertions of Baron STORCK, we conſider many of them as merely inſtances of failure of what Baron STORCK had led to expect; but ſuch negatives do not allow them to afford any concluſion. I know from my own obſervation, that many of the trials had been unfairly made.

Sometimes the proper plant had not been employed, and frequently that it had been improperly prepared. I have frequently found the extract, both as prepared at Vienna and here at home, a perfectly inert ſubſtance, and producing no ſenſible effects on the body, though given in very large quantities. The nicety of Dr MORRIS, in diſtinguiſhing the extracts of different places, ſeems to depend upon the general fallacy attending this preparation. What this is owing to we cannot clearly determine; but ſuch is the uncertainty of extracts of the cicuta, that the practitioners of this country have very univerſally deſerted the uſe of that preparation; and when they think of employing this plant, they always employ it in powder. This indeed is commonly more to be depended upon than the extract; but the powder alſo, from improper drying or keeping, is liable to uncertainty, and we have frequently found it in a perfectly inert ſtate.

IN illuſtration of all this I give a particular hiſtory: A lady labouring under a cancer in the breaſt was adviſed to uſe the cicuta; and ſhe accordingly got a quantity of it in powder, and weighed out the doſes of it for herſelf. She began with a ſmall doſe; and feeling no ſenſible effects from that, ſhe went on increaſing the doſe till ſhe had taken a dram for a doſe. By the time ſhe had come to this ſize of doſe, ſhe had taken the whole of the parcel ſhe had got from the apothecary, and therefore ſent to him for a freſh parcel of the powder. She had, however, been adviſed, that when ſhe was to paſs from one parcel to another, ſhe ſhould ſuſpect ſome inequality in the different parcels; and therefore, though ſhe had taken a former parcel in a very large doſe, ſhe ſhould begin any freſh parcel with a ſmall doſe only. Upon this occaſion, therefore, ſhe was reſolved to follow this advice; and as ſhe had taken ſixty grains of the former, ſhe would take twenty only of the new parcel: but ſuch was the inequality of the two parcels, that ſhe was nearly killed by the twenty grains ſhe had then takn. In ten or fifteen minutes after ſhe had taken the doſe, ſhe was affected with ſickneſs, tremor, giddineſs, delirium, and convulſions. Happily for her the ſickneſs proceeded to a vomiting, with which part of the powder was thrown up; but the vomiting continued, and probably till the whole was thrown out: and notwithſtanding this, the delirium, and even the convulſions, continued for ſome hours after. Theſe ſymptoms, however, gradually abating, a ſleep at length came on; and after ſome hours ſhe waked, free from all the former ſymptoms. This ſhows ſufficiently the unequal ſtate of the hemlock in powder. The ſame powder in the quantity of five or ſix grains only occaſioned ſome tremor and giddineſs, when the former parcel taken to ſixty grains had no ſenſible effects at all. I hold it as a rule, that when hemlock, either in the form of powder or extract, has no ſenſible effects when taken to twenty grains for a doſe, the medicine may be ſuppoſed to be imperfect; and that, if it is to be continued, another parcel of it ſhould be employed.

From what has been ſaid, it will ſufficiently appear, that the many failures that have been reported of hemlock do not afford any proof of its being uſeleſs as a medicine; and, as it has manifeſtly ſtrong powers in affecting the human ſyſtem, I conclude that, like all other ſubſtances poſſeſſed of ſuch powers, it may be a very efficacious medicine. This, we believe, will be allowed; but it may ſtill be a queſtion, in what diſeaſes and caſes of them it may be of peculiar efficacy? Here I am at a loſs, from my own experience or that of others, to anſwer this queſtion. We have known it uſeful in reſolving and diſcuſſing ſchirroſities of different kinds, and particularly thoſe of a ſcrophulous nature. We have alſo known it uſeful in healing ulcers which had come upon ſchirrous tumours, and which continued to be ſurrounded with ſuch ſchirroſity; and in ſome ulcers certainly that approached to the nature of cancer. Even in caſes that might certainly be conſidered as truly cancerous, I am ſo far from being of the opinion of BIERKEN of its rather aggravating the diſeaſe, that I have found it in ſeveral caſes to relieve the pains, and mend the quality of the matter proceeding from the ſore, and even to make a conſiderable approach towards healing it; though I muſt own that I never was concerned in a cancerous caſe in which the cure of the ſore was completed.

THIS medicine has been by many reported as uſeful in ſyphilis; and one of the moſt competent judges on this ſubject, Mr JOHN HUNTER, has found it to be ſo. I myſelf have employed it in ſome caſes with advantage, but in ſeveral others I have not found any benefit from its uſe. The ancients were of opinion that it diminiſhed the venereal appetite; but BERGIUS thinks it has a contrary effect, and mentions a caſe in which it had reſtored the power of venery when it had been loſt: but ſo far as my obſervation goes, there is no foundation for either the one or the other opinion.

I HAVE ſaid above, that it often fails from its being exhibited in an inert ſtate, and that it can only ſucceed when it ſhows ſome ſenſible effects on the ſyſtem: but candour obliges me to acknowledge, that in many caſes where it did ſhow ſenſible effects, it failed in curing a diſeaſe, though ſimilar to thoſe in which it had ſucceeded; and I am yet at a loſs to aſcertain the caſes to which it is moſt certainly adapted.

WITH reſpect to the pharmaceutic treatment of hemlock, there are different opinions concerning the proper time of gathering the plant. We have been in uſe here to gather it before the flowers, and even almoſt before the flower-bearing ſtalks appear: and from ſome experiments we have been led to judge, that at this period of its growth the virtues of the hemlock are the ſtrongeſt. Dr FOTHERGILL was of opinion that theſe virtues were ſtronger at a more advanced period, when the flowers were falling off, and the ſeeds beginning to be formed; and if we underſtand BERGIUS rightly, he ſeems to be for allowing the growth to proceed ſtill farther, and till the ſeeds are ready to fall off. We muſt leave it to farther experience to determine this matter more exactly, though I believe it is of little conſequence which ever of the practices be followed.

We have for the moſt part employed the leaves of the plant; but a phyſician, lately of this place, was ſtrongly perſuaded that the ſeeds, treated by decoction, and brought into the form of an extract, gave a preparation more powerful than that made of the leaves, and therefore gave occaſion for ſuch an extract to be introduced into our diſpenſatory: but this property of the ſeeds I have not had confirmed by my own obſervations, and muſt think it ſucceeded no better with the other fellows of the college, as we do not find that ſuch a preparation continues to be made.

WE have obſerved above, that both the extract and the powder are liable to be in an imperfect ſtate; and we have not attempted to aſſign the cauſes of this, but muſt earneſtly recommend it to the apothecary to find out thoſe cauſes, that they may be avoided: and to engage his attention to this matter, we muſt repeat what has been ſaid above, that unleſs the hemlock produces ſenſible effects on the nervous ſyſtem, it cannot be a remedy in any diſeaſe; and we are diſpoſed to add, that thoſe effects muſt be pretty ſtrong, in order to render the hemlock an efficacious medicine. The practitioner indeed ſhould take care, by bringing on theſe effects by degrees, to avoid its becoming a poiſon; but it is to be ſuſpected, that by bringing on the effects too ſlowly, the medicine fails in many caſes; and by its being gradually habituated to the ſyſtem, that it has leſs effect than it might otherwiſe have had.

BARON STORCK is very fond of repreſenting the hemlock as a very innocent medicine: and we have known it taken for a very great length of time without any bad effects; but I am certain it may prove a poiſon, and that it is only by its being ſlowly habituated to the ſyſtem that it proves, as every other vegetable poiſon may be, ſufficiently innocent.

IN mentioning the adminiſtration, we muſt remark, that it is often applied externally with advantage, and particularly in the form of poultice; but in the form of plaſter, in which it has been often employed, it ſeems to be of very little effect. In the form of poultice it has been uſeful in reſolving ſome indurations, eſpecially thoſe of the ſcrophulous kind; but in the indolent ſcirrhoſities in the breaſts of women it is ſeldom of any ſervice: and we have found the frequent application of hemlock poultices do much harm, by bringing theſe tumours ſooner to an open cancer.

CICUTA VIROSA.

THE root of this plant is well known to be a ſtrong poiſon both to men and brute animals, with the exception of the goats and ſwine of Norway, who are not hurt by it. Its deleterious powers in man are ſo conſiderable, that they have prevented its being employed as an internal medicine; though with me this is not a ſufficient reaſon for our not attempting a trial of this and ſome other of the umbelliferous poiſons.

IF it be true that both the roots and leaves become much milder by drying, we might probably find an intermediate ſtate between the freſh and the dry, with which our trials of this might be made with more ſafety. The roots of the cicuta have been much recommended as an external remedy in many caſes; but as theſe recommendations have proceeded upon the alleged experience of a barbarous people, we cannot pay much regard to them.

BELLADONNA.

THIS is a medicine that has been very long known for its narcotic and deleterious powers; and from theſe powers it is ſufficiently probable that it might be an efficacious medicine. Its berries and leaves are the parts which have been chiefly employed: The former being taken unwittingly by children, have often ſhown their poiſonous quality; but this does not hinder us from believing that GESNER employed them ſafely as a ſoporiferous and anodyne medicine; and we have often reſolved to imitate his practice, but have always been by certain accidents diverted from it.

IT is the leaves that have of late been eſpecially employed as a medicine; and they have been employed in powder, in infuſion, and in extract from a watery infuſion. The latter I have often found, like that of the hemlock, to be an inert ſubſtance; but the powder and infuſion of the leaves are more certainly active. They have both been eſpecially employed in the cure of cancers; and there are many inſtances of their utility reported by perſons of good credit: but at the ſame time there are as many reports of its having been employed without ſucceſs; and the latter reports are ſometimes from perſons who had upon other occaſions employed it with advantage.

THE ſame variety of event has occurred to myſelf. I have had a cancer of the lip entirely cured by it; a ſcirrhoſity in a woman's breaſt, of ſuch a kind as frequently proceeds to a cancer, I have found entirely diſcuſſed by the uſe of it; a ſore a little below the eye, which had put on a cancerous appearance, was much mended by the internal uſe of the belladonna: but the patient having learned ſomewhat of the poiſonous nature of the medicine, refuſed to continue the uſe of it, upon which the ſore again ſpread and was painful; but upon a return to the uſe of the belladonna, was again mended to a conſiderable degree: when the ſame fears again returning, the uſe of it was again laid aſide, and with the ſame conſequence of the ſores becoming worſe. Of theſe alternate ſtates, connected with the alternate uſe of, and abſtinence from, the belladonna, there were ſeveral of theſe alternations which fell under my own obſervation; but the patient being removed to a great diſtance, I do not know how long theſe changes took place: but in the mean time, I was very well convinced of the power and virtues of the medicine in certain caſes. At the ſame time, I muſt own, that in ſeveral caſes, both of ſcirrhoſity and of open ſores, it has not anſwered my expectations.

I HAVE only further to add, that the infuſion of the belladonna is ready to bring on a dryneſs and conſiderable ſtricture of the pharynx and adjoining parts of the æſophagus. In one inſtance of a perſon uſing it at a diſtance and without any communication with me, when taking the infuſion, with the effect of nearly healing up a cancer of the lip, he had this dryneſs and ſtricture come on to a great degree, and was ſuddenly killed by a very copious throwing up of blood, ſeemingly, as I was informed, proceeding from the fauces.

HYOSCIAMUS.

This is a plant which has been long well known for its narcotic and deleterious qualities; and many inſtances are reported of its fatal effects in man and other animals: but notwithſtanding its deleterious powers, it has been employed as a medicine both in ancient and modern times. The roots, the ſeeds, and the leaves, have all been upon occaſion employed; but till very lately it was eſpecially the ſeeds which were much commended for reſtraining hæmorrhagies of all kinds, and particularly by the excellent Mr BOYLE. The credit however of this excellent perſon, in reporting the virtues of medicines, for reaſons I have given before, does not ſtand high with us. We have not tried the ſeeds, but have employed the extract of the leaves very often. This, like other narcotic ſubſtances, will ſometimes moderate and reſtrain hæmorrhagies; but for the reaſons we gave before on the ſubject of opium, we are perſuaded, that, except where the hæmorrhagy manifeſtly depends upon a particular irritation, henbane, and all other narcotics, may be very hurtful.

THE ſeeds for a long time paſt have not been employed in the practice of Britain, nor were the leaves or any preparation of them thought of till lately, that the Baron STORCK endeavoured to introduce the extract of the leaves. As uſual with him, he gives us many caſes of different diſeaſes in which this extract had been uſeful; but ſo far as we have learned, his credit has not been ſupported by other practitioners.

WITH reſpect to its effects in mania, melancholia, and epilepſy, the experiments of GREDING, reported in LUDWIG's Adverſaria, are very contradictory to thoſe of Baron STORCK. In epilepſy, and various convulſive affections for which Baron STORCK particularly recommends the extract of the henbane, we have very frequently employed it; but have never found it of any great virtue, nor of more than what we have found in opium. We have indeed found the hyoſciamus to be often an agreeable anodyne and ſoporiferous medicine; and we have frequently found it ſuch in perſons who, from particular circumſtances, did not agree with opium, and particularly becauſe it was leſs binding to the belly than opium. We judge, however, that it is more ready in full doſes to give delirium than opium is; and therefore we have found it in many caſes to give turbulent and unrefreſhing ſleep: and notwithſtanding its laxative qualities, for which we had employed it, we have been obliged to lay it aſide.

BARON STORCK and ſome other practitioners have found the extract of henbane uſeful in ſmall doſes; and in a few inſtances I have found the ſame: But though I always begin with the ſmall doſe of a grain or two, yet in the extracts prepared in this country, we have ſeldom found the ſoporiferous or anodyne effects appear till we had proceeded to doſes of eight or ten grains; and we have often found it neceſſary to go further, to fifteen, and even to twenty grains. We have often employed ſuch large doſes with advantage; and where they had been brought on by degrees, without any bad effects. We muſt however remark here, that it is almoſt only when the extract of henbane is employed in large doſes that its laxative effects are very remarkable.

NICOTIANA.

THIS is a well-known drug, of a narcotic quality, which it diſcovers in all perſons, even in ſmall quantity, when firſt applied to them. I have known a ſmall quantity of it, ſnuffed up the noſe, produce giddineſs, ſtupor, and vomiting; and when applied in different ways, in larger quantity, there are many inſtances of its more violent effects, even of its proving a mortal poiſon. In all theſe inſtances it operates in the manner of other narcotics: But along with its narcotic qualities it poſſeſſes alſo a ſtrongly ſtimulant power, perhaps with reſpect to the whole ſyſtem, but eſpecially with reſpect to the ſtomach and inteſtines; ſo as readily, even in no great doſes, to prove emetic and purgative.

BY this combination of qualities, all the effects of tobacco may be explained; but I ſhall begin with conſidering its effects as they appear in the uſe of it as an article of living.

As ſuch it has been employed by ſnuffing, ſmoking, and chewing; practices which, as having been for two hundred years paſt common to all Europe, need not be deſcribed here. Like other narcotics, the uſe of it may be introduced by degrees; ſo that its peculiar effects, even from large quantities employed, may not, or may hardly at all appear: but this does not at all contradict the account I have given of its quality with reſpect to perſons unaccuſtomed to it, and even of its tendency to ſhow its power in thoſe much accuſtomed to it: for even in theſe, the power of habit has its limits; ſo that in perſons going but a little beyond the doſe to which they have been accuſtomed, very violent effects are ſometimes produced.

ON this ſubject it is to be remarked, that the power of habit is often unequal; ſo that in perſons accuſtomed to the uſe of tobacco, a leſſer quantity than what they had been accuſtomed to, will often have ſtronger effects than had before commonly ap-

appeared. I knew a lady who had been for more than twenty years accuſtomed to take ſnuff, and that at every time of day; but ſhe came at length to obſerve, that ſnuffing a good deal before dinner took away her appetite: and ſhe came at length to find, that a ſingle pinch, taken any time before dinner, took away almoſt entirely her appetite for that meal. When, however, ſhe abſtained entirely from ſnuff before dinner, her appetite continued as uſual; and after dinner, for the reſt of the day, ſhe took ſnuff pretty freely without any inconvenience.

THIS is an inſtance of the inequality of the power of habit in exerting its effects: but in what caſes this may take place, we cannot determine, and muſt now go on in marking its uſual and ordinary powers. When ſnuff, that is, tobacco in powder, is firſt applied to the noſe, it proves a ſtimulus, and excites ſneezing; but by repetition that effect entirely ceaſes.

WHEN ſnuff is firſt employed, if it be not both in ſmall quantity and be not thrown out immediately by ſneezing, it occaſions ſome giddineſs and confuſion of head; but by repetition theſe effects ceaſe to be produced, and no other effect of it appears in the accuſtomed, when not taken beyond the accuſtomed quantity. But even in the accuſtomed, when it is taken beyond the uſual quantity, it produces ſomewhat of the ſame giddineſs and confuſion of head that it did when firſt employed; and in ſeveral caſes, theſe effects in the accuſtomed, depending on a larger doſe, are not only more conſiderable, as they act on the ſenſorium, but as they appear alſo in other parts of the ſyſtem, particularly in the ſtomach, occaſioning a loſs of appetite, and other ſymptoms of a weakened tone in that organ.

WITH reſpect to this, it is to be obſerved, that perſons who take a great deal of ſnuff, though they ſeem, from the power of habit, to eſcape its narcotic effects; yet as they are often liable to go to exceſs in the quantity taken, ſo they are ſtill in danger from theſe effects operating in an inſenſible manner; and I have obſerved ſeveral inſtances of their being affected in the ſame manner as perſons are from the long continued uſe of other narcotics, ſuch as wine and opium; that is, by a loſs of memory, by a fatuity, and other ſymptoms of the weakened or ſenile ſtate of the nervous ſyſtem, induced before the uſual period.

AMONG other effects of exceſs in ſnuffing, I have found all the ſymptoms of dyſpepſia produced by it, and particularly pains of the ſtomach, occurring every day. The dependence of theſe upon the uſe of ſnuff became very evident from hence, that upon an accidental interruption of ſnuffing for ſome days, theſe pains did not occur; but upon a return to ſnuffing, the pains alſo recurred; and this alternation of pains of the ſtomach and of ſnuffing having occurred again, the ſnuff was entirely laid aſide, and the pains did not occur for many months after, nor, ſo far as I know, for the reſt of life.

A SPECIAL effect of ſnuffing is its exciting a conſiderable diſcharge of mucus from the noſe; and there have been ſeveral inſtances of headachs, toothachs, and ophthalmias relieved by this means: and this is to be particularly remarked, that when this diſcharge of mucus is conſiderable, the ceaſing or ſuppreſſion of it by abſtaining from ſnuff, is ready to occaſion the very diſorders of headach, toothach, and ophthalmia, which it had formerly relieved.

ANOTHER effect of ſnuffing to be taken notice of is, that as a part of the ſnuff is often carried back into the fauces, ſo a part of this is often carried down into the ſtomach, and then more certainly produces the dyſpeptic ſymptoms mentioned. Theſe are the conſiderations that relate to ſnuffing; and ſome of them will readily apply to the other modes of uſing this drug.

SMOKING, when firſt practiſed, ſhows very ſtrongly the narcotic, vomiting, and even purging powers of tobacco, and it is very often uſeful as an anodyne; but by repetition theſe effects diſappear, or only ſhow themſelves when the quantity ſmoked is beyond what habit had before admitted of; and even in perſons much accuſtomed to it, it may be carried ſo far as to prove a mortal poiſon. From much ſmoking all the ſame effects may ariſe which we ſaid might ariſe from exceſs in ſnuffing.

WITH reſpect to the evacuation of mucus which is produced by ſnuffing, there are analogous effects produced by ſmoking, which commonly ſtimulates the mucous follicles of the mouth and fauces, and particularly the excretories of the ſalivary glands. By the evacuation from both ſources, with the concurrence of the narcotic power, the toothach is often greatly relieved by it; but we have not found the ſmoking relieve headachs and ophthalmias ſo much as ſnuffing often does. Sometimes ſmoking dries the mouth and fauces, and occaſions a demand for drink; but, as commonly the ſtimulus it applies to the mucous follicles and ſalivary glands draws forth their liquids, it occaſions on the other hand a frequent ſpitting.

So far as this is of the proper ſaliva, it occaſions a waſte of that liquid ſo neceſſary in the buſineſs of digeſtion; and both by this waſte and by the narcotic power at the ſame time applied, the tone of the ſtomach is often weakened, and every kind of dyſpeptic ſymptoms are produced. Though in ſmoking a great part of the ſmoke is again blown out of the mouth, ſtill a part of it muſt neceſſarily paſs into the lungs; and its narcotic power applied there often relieves ſpaſmodic aſthma; and by its ſtimulant power it there alſo ſometimes promotes expectoration, and proves uſeful in the catarrhal or pituitous difficulty of breathing.

SMOKING has been frequently mentioned as a means of guarding men againſt contagion. In the caſe of the plague, the teſtimony of DIMERBROEK is very ſtrong; but RIVINUS and others give us many facts which contradict this: and CHENOT gives a remarkable inſtance of its inutility. We cannot indeed ſuppoſe that tobacco contains an antidote of any contagion, or that in general it has any antiſeptic power; and therefore we cannot allow that it has any ſpecial uſe in this caſe: but it is very probable that this and other narcotics, by diminiſhing ſenſibility, may render men leſs liable to contagion; and by rendering the mind leſs active and anxious, it may alſo render men leſs liable to fear, which has ſo often the power of exciting the activity of contagion. The antiloimic powers of tobacco are therefore on the ſame footing with thoſe of wine, brandy, and opium.

THE third mode of uſing tobacco is that of chewing it, when it ſhows its narcotic qualities as ſtrongly as in any other way of applying it; though the nauſeous taſte of it commonly prevents its being carried far in the firſt practice. When the practice, however, is continued, as it is very difficult to avoid ſome part of it diſſolved in the ſaliva from going down into the ſtomach; ſo this, with the nauſea excited by the taſte, makes vomiting more readily occaſioned by this than the other modes of applying it. They are the ſtrong, and even diſagreeable impreſſions repeated, that give the moſt durable and tenacious habits; and therefore the chewing of tobacco is apt to become one of theſe: and it is therefore in this way that it is ready to be carried to the greateſt exceſs, and to ſhow all the effects of the frequent and large uſe of narcotics. As it commonly produces a conſiderable evacuation from the mouth and fauces, ſo it is the moſt powerful in relieving the rheumatic affection of toothach. This practice is alſo the occaſion of the greateſt waſte of ſaliva; and the effects of this in weakening digeſtion, and perhaps from thence eſpecially, its noted effect of producing emaciation may appear.

THESE are the effects of the different modes of employing tobacco, when it comes to be of habitual uſe and an article of living. Theſe effects depend eſpecially upon its narcotic power, and certain circumſtances accidentally attending its application to the noſe and mouth; but as we have obſerved before, that beſide its narcotic, it poſſeſſes alſo a ſtimulant power, particularly with reſpect to the alimentary canal: by this it is frequently employed as a medicine for exciting either vomiting or purging, which it does as it happens to be more immediately applied to the ſtomach or to the inteſtines.

AN infuſion of from half a dram to a dram of the dried leaves, or of theſe as they are commonly prepared for chewing, for an hour or two, in four ounces of boiling-water, affords an emetic which has been employed by ſome practitioners, but more commonly by the vulgar only. As it has no peculiar qualities as an emetic, and its operation is commonly attended with ſevere ſickneſs, it has not been, nor is it likely ever to come into common practice with phyſicians.

IT is more commonly employed as a purgative in glyſters; and, as generally very effectual, it is employed in all caſes of more obſtinate coſtiveneſs; and its powers have been celebrated by many authors. I have known it to be in frequent uſe with ſome practitioners; and it is indeed a very effectual medicine, but attended with this inconvenience, that when the doſe happens to be in any exceſs, it occaſions ſevere ſickneſs at ſtomach; and I have known it frequently occaſion vomiting.

IT is well known, that in caſes of obſtinate coſtiveneſs, in ileus and incarcerated hernia, the ſmoke of burning tobacco has been thrown into the anus with great advantage. The ſmoke operates here by the ſame qualities that are in the infuſions of it above mentioned; but as the ſmoke reaches much further into the inteſtines than injections can commonly do, it is thereby applied to a larger ſurface, and may therefore be a more powerful medicine than the infuſions. In ſeveral inſtances, however, I have been diſappointed of its effects, and have been obliged to have recourſe to other means.

THE infuſion of tobacco, when it is carried into the blood-veſſels, has ſometimes ſhown its ſtimulant powers exerted in the kidneys; and very lately we have had it recommended to us as a powerful diuretic of great ſervice in dropſy. Upon the faith of theſe recommendations we have now employed this remedy in various caſes of dropſy, but with very little ſucceſs. From the ſmall doſes that are proper to begin with, we have hardly obſerved any diuretic effects; and though from larger doſes they have in ſome meaſure appeared, we have ſeldom found them conſiderable: and when, to obtain theſe in a greater degree, we have gone on increaſing the doſes, we have been conſtantly reſtrained by the ſevere ſickneſs at ſtomach, and even vomiting, which they occaſioned; ſo that we have not yet learned the adminiſtration of this remedy ſo as to render it a certain or convenient remedy in any caſes of dropſy.

THE ſame circumſtances have occurred to ſeveral other practitioners of this city and neighbourhood; and of late the trials of it have been very generally omitted, owing perhaps to our practitioners being directed at the ſame time to the uſe of the digitalis, with which they have had ſome more ſucceſs.

FROM ſome experiments we are certain that tobacco contains a quantity of volatile parts that may be diſſipated by long boiling in water; and that by ſuch a practice its emetic, purgative, and narcotic qualities may be greatly diminiſhed; and we are of opinion that the preparation in extract, as preſcribed in the Wirtenberg diſpenſatory, is upon a good foundation, and may be employed in pectoral caſes with more advantage and ſafety than the ſimple infuſion or decoction made by a ſhort boiling only.

WHEN we were reſtrained in employing the infuſion of tobacco as a diuretic, as mentioned, we expected to ſucceed better with the decoction; and I have found, that by long boiling this might be given in much larger doſes than the infuſion: but we ſtill found it retaining ſo much of the emetic quality, that we could not employ it as a diuretic without being interrupted in its uſe by the ſame emetic quality that had interrupted the uſe of the infuſion.

BESIDES the internal uſes of tobacco mentioned, I muſt now remark, that it has likewiſe been commended for its virtues as externally employed. I have known the infuſion employed with advantage as a lotion for ſome obſtinate ulcers: but the many inſtances of its being abſorbed, and proving thereby a violent poiſon, diſſuade from ſuch a practice; eſpecially as there are other medicines, of as much efficacy, that may be employed with much more ſafety. BERGIUS recommends it to be employed as a fomentation in the paraphymoſis; but we have had no opportunity of employing it.

STRAMONIUM.

THIS is a powerful narcotic ſubſtance, and many inſtances are given of its proving a fatal poiſon. The ſeeds have been eſpecially remarkable in this way, but the leaves are poſſeſſed of the ſame quality.

NEITHER of them have been employed as medicines till the Baron STORCK, among the other poiſonous plants, thought of trying this. He made the expreſſed juice of the plant into an extract, and employed this in ſome caſes of mania, epilepſy, and ſome other convulſive affections, and, as he reports, with ſome advantage; but he has been more reſerved in his trials with this, and more temperate in recommending it, than with reſpect to moſt of the others he has practiſed with. Some other writers, however, have employed it, and recommended it; but they are chiefly the experiments of GREDING which properly aſcertain its powers and virtues.

THIS induſtrious phyſician employed it in a great number of maniacal caſes; and, beginning with ſmall doſes, he proceeded to very large ones, but could not, in any of the caſes he employed it in, obtain a cure. It is remarkable, that in his experiments he employed two different preparations of the extract of the ſtramonium; the one he got from Vienna by the favour of Baron STORCK, the other from Leipſic by the favour of Profeſſor LUDWIG. The latter he found to be much more powerful than the former; and, with reſpect to this, he puts the queſtion, Whether the difference was to be aſcribed to the difference of the ſoil in which the plants grew, or to any other cauſe? I conſider it as a mark of the fallacy of extracts, and mention it here as a proof of that.

Dr Greding employed the ſame extracts in a great number of epileptic caſes, and in caſes of epilepſy joined with mania; but, except in one ſingle inſtance, he made no cure: and the great number of caſes in which it failed, lead me to judge it to be a medicine ſeldom ſuited to the cure of thoſe diſeaſes. There are indeed caſes of both diſeaſes reported by perſons of good credit, in which the ſtramonium ſucceeded: but I do not admit this as a proof of any peculiar power in the ſtramonium, as there are many inſtances of other narcotics having the ſame effect. I have no doubt that narcotics may be a remedy in certain caſes of mania and epilepſy; but I have not, and I doubt if any other perſon has, learned to diſtinguiſh the caſes to which ſuch remedies are properly adapted. It is therefore that we find the other narcotics, as well as the ſtramonium, to fail in the ſame hands in which they had in other caſes ſeemed to ſucceed. It is this conſideration that has occaſioned my neglecting the uſe of the ſtramonium, and therefore prevented me from ſpeaking more preciſely from my own experience on this ſubject.

LAURO-CERASUS.

This is a ſedative of the moſt powerful kind, but hitherto little employed as a medicine; but I enter upon the conſideration of it here, as the matter it contains, which renders it ſo powerful, is alſo preſent in ſeveral ſubſtances which have been frequently employed as medicines, and whoſe properties therefore may be beſt illuſtrated by treating firſt of the Lauro-cerafus.

Since the year 1733, when the firſt account of the poiſonous quality of the lauro-ceraſus was publiſhed, many experiments have been made, which all concur in ſhowing, that the diſtilled water from this plant is one of the moſt powerful poiſons that we are acquainted with; and theſe experiments have now been publiſhed in ſo many books, that it ſeems quite unneceſſary to repeat them here.

THE operation of this poiſon has been very various, according to the doſe in which it has been employed, and to the ſize, perhaps the conſtitution, of the animal to which it has been applied; but in a certain doſe it has univerſally proved a fatal poiſon. In many caſes it has very immediately induced death, without any previous diſorder; and if, in other caſes, it has excited convulſions, tetanus, palſy, and ſeveral evacuations, it does not ſeem owing to any peculiar property of this poiſon, but to the moderate doſe of it, which, during its gradual operation, allows a various reaction of the ſyſtem. We have a fine illuſtration of this in LANGRISH's experiments, in which, p. 67, he tells us that one ounce of laurel-water will occaſion more violent and ſtronger convulſions than five or ſix ounces will do. For this he gives a theory which I do not underſtand; and I think it needs no other than that the larger doſe proves more immediately fatal.

THE tendency of the lauro-ceraſus is plainly to deſtroy the mobility of the nervous power, and thereby the vital principle; and, when employed in ſufficient quantity, it does this very ſuddenly in every animal to which it has been applied, without exciting inflammation in the part to which it had been more immediately applied, and without producing any ſenſible change on the ſtate of the fluids. If it ſeems to ſome perſons to coagulate, and to others to render the fluids more thin, we have not taken any pains to aſcertain either of theſe facts, becauſe there is no proof of its acting directly upon the fluids; and therefore, any changes which happen to appear in theſe muſt be imputed to a change in the action of the veſſels, which we know has a great power in changing the ſtate of the fluids. We muſt own, however, that to explain the effects of the lauro-ceraſus in this reſpect, we know yet too little of the changes which the fluids are capable of undergoing by the various action of the veſſels.

WITH reſpect to the ſedative power of the lauro-ceraſus, it may be remarked, that its operation upon the nervous ſyſtem is different from that of opium and other narcotic powers, which, in their firſt operation, commonly induce ſleep, and which I do not find to have been ever obſerved as the effect of the lauro ceraſus. May it be ſuppoſed that the animal and vital functions depend ſo much upon a different condition of the nervous ſyſtem, that one kind of poiſon may act upon one of theſe functions more readily than upon the other, while another kind of poiſon may act more directly upon that other ſet of functions and leſs upon the former. If there is any foundation for this ſuppoſition, we might ſay that the narcotic poiſons act firſt upon the animal functions, though their power may at length be extended alſo to the vital; and that the lauro-ceraſus, and other poiſons analogous to this, act more immediately upon the vital functions, without ſhowing any intermediate affection of the animal. If ſuch a ſpeculation may be indulged, we would allege that the poiſon of the mad dog ſeems to operate more immediately upon the natural functions than upon either the vital or animal. But whether ſuch ſpeculations are to be indulged, or what application they are capable of, we muſt leave to future philoſophers to judge.

THE active matter of the lauro-ceraſus lies in its moſt volatile parts, and is therefore readily carried over with water or ſpirit in diſtillation, and may be ſtill rendered more active by cohobation, and eſpecially if, without any addition of water, it is diſtilled in balneo mariæ. In diſtillation with water, it gives out an eſſential oil, which, either taken by itſelf, or diffuſed, as it may readily be, in the diſtilled water, ſhows that it contains ſome of the moſt active parts of the plant.

BY theſe operations for obtaining the more volatile parts of the lauro-ceraſus, a ſingularly powerful poiſon is obtained; but the ſame power is alſo to be found in the entire ſubſtance of the plant, with this difference only, that this, to ſhow the ſame degree of power, muſt be employed in much larger doſes than the other. This explains very well why a portion of the plant, often employed as an article of diet, had not before diſcovered its poiſonous quality: And this leads me to remark, that even ſince its poiſonous qualities have been diſcovered, it has been propoſed to be employed as a medicine, either by employing the volatile parts in ſmall doſes, or the ſubſtance of the whole plant in larger. That a matter of ſuch power in changing the ſtate of the animal œconomy ſhould, in certain circumſtances, prove a medicine, we can have no doubt; but we have not yet learned to what circumſtances of diſeaſe it is peculiarly adapted. Its power of rendering the blood more fluid is not certainly or univerſally proved; and though it were, as, by the reflection we made above, the change that appears is more probably depending upon the ſtate of the veſſels than any direct action upon the fluids; ſo we hold this ſtate of matters to be too myſterious to admit of any application in medicine. We muſt remark further, that all judgment made from the ſtate of the blood drawn out of the veins to that of its ſtate in the blood-veſſels, is extremely fallacious, unleſs a nice and ſtrict attention is given to the circumſtances of the extravaſation, and which we have not found to be commonly beſtowed.

THERE is a circumſtance commonly taken notice of in favour of a fluidity being induced by the lauro-ceraſus, which is, that the blood in ſeveral places is found to have paſſed from the red veſſels into the ſerous; but as this ſeems to have happened only after frequent and ſtrong convulſions, it is with more probability imputed to an increaſed action in the arteries, which has often this effect of puſhing red blood into the ſerous veſſels than to the increaſed fluidity of the maſs: and it is in the ſame manner that we would account for the fullneſs of the veins and the emptineſs of the arteries, which have been found to be the effects of the lauro-ceraſus. To confirm theſe opinions with regard to the fluidity of the blood, and the application of it to medicine, it is only neceſſary to add, that when the lauro-ceraſus is given in ſuch a manner as inſtantly to kill, without occaſioning almoſt any other diſorder, there is not any mark of change in the ſtate of the blood to be perceived; and upon that occaſion, that the death is owing to an operation upon the blood, I believe there is no other phyſiologiſt in Europe, except the Abbè Fontana, who can imagine.

I HAVE made theſe obſervations to prevent any raſh application of the lauro-ceraſus, from the ſuppoſition of its producing a fluidity of the blood: and I find no proof of its having been applied, upon that ſuppoſition, to any good purpoſe; and particularly that it has been of uſe in caſes of phthiſis pulmonalis, or that it has been of uſe in reſolving obſtructions of the liver, ſeems to be concluded upon too few experiments.

ALTHOUGH we do not find the benefit of its internal uſe in reſolving obſtructions well aſcertained, we are ſomewhat diſpoſed to believe, that its external uſe may be uſeful in reſolving certain ſchirroſities. Even this power, however, is not ſufficiently aſcertained, though we ſhall hereafter mention ſome analogies that ſeem to ſupport it. By another analogy alſo, I find a virtue aſcribed to the lauro-ceraſus rendered very probable: Dr BROWN LANGRISH tells us, that the lauro-ceraſus in his neighbourhood was frequently employed in the cure of agues. He unhappily omits the doſe, manner of adminiſtration, or peculiar circumſtances of the diſeaſe; but the experiments of BERGIUS with bitter almonds ſufficiently confirm the general power of ſuch bitters in the cure of intermittents.

WE do not find room to ſay any more on the medicinal virtues of the lauro-ceraſus; but, from its general power, they are certainly probable, and will hereafter, in the hands of a future STORCK, be aſcertained. To encourage ſuch inquiry, we muſt remark, that the lauro-ceraſus has hardly in any experiment ſhown any tendency to produce topical inflammation; and in many experiments on brutes, though the employment of the lauro-ceraſus has been carried ſo far as to produce various and violent diſorders of the ſyſtem, yet upon withdrawing the exhibition of it, the animal has ſoon after recovered a ſeemingly entire ſtate of health. Theſe may give encouragement to ſome trials; but I hope it will never be forgot, that a matter which has ſo ſtrong a tendency to extinguiſh the vital principle is to be employed with the utmoſt caution.

HERE, immediately after the lauro-ceraſus, it ſeems proper to mention ſome articles of the materia medica which contain the ſame kernel bitter, and which can be extracted from them in ſuch a manner as to ſhow the ſame deleterious power; but as they contain it in a leſs concentrated and weaker ſtate, they are therefore more readily to be admitted as articles of the materia medica.

THE firſt we ſhall take notice of is the

CERASA NIGRA.

THE kernels in the ſtones of theſe fruits do certainly contain a like matter with the lauro-ceraſus; and by a certain management a very powerful poiſon can be obtained from them, but certainly they do not contain it in the ſame proportion: and it is a queſtion with me if the diſtilled water, as formerly extracted from black cherries and their bruiſed kernels, contains it in ſuch a quantity as to engage the colleges both of London and Edinburgh to reject an agreeable water from their diſpenſatories. If the kernels are bruiſed only ſo far as neceſſary to the breaking of the ſtones, and at the ſame time that a good deal more water is added than the weight of the cherries, and that leſs than the whole of this is drawn off, I am perſuaded that ſuch a water will be very ſafe, and particularly in the quantities employed in our juleps. I ſhall not indeed adviſe the tampering with ſuch a matter in the caſe of infants; but ſurely that a matter, under a certain preparation, and in a certain doſe, being a poiſon, will not, in the preſent age, be an objection to its being employed in other circumſtances as a medicine.

I MIGHT here take notice of the flowers and leaves of the peach tree, all of which contain the kernel bitter; but after what I have ſaid of the black cherry, and am to ſay of the bitter almond, I do not think it neceſſary to ſpeak of ſubſtances which I have not been acquainted with in practice.

AMYGDALÆ AMARÆ.

THESE have been long known to be a poiſon with reſpect to many brute animals; and there are ſome inſtances alleged of their being ſuch to men. We at preſent underſtand this, from obſerving that they contain the ſame peculiar bitter that is found in the lauro-ceraſus, and in the other kernels mentioned above. It is alleged that they are not ſo powerful with reſpect to men as they are to other animals; and they have, in a certain quantity, been often admitted both in diet and medicine. Their medicinal qualities, however, are, as I have ſaid before, not well aſcertained; but there is one virtue, which is, their being a remedy in intermittent fevers, that is well eſtabliſhed on the authority of the learned BERGIUS.

HIS manner of adminiſtration is the following: He takes two drams of ſoluble tartar and an ounce and half of honey. Theſe he diffuſes in a pound of water; and with this water he makes an emulſion with one ounce of bitter almonds, to be ſtrained in the ordinary manner. Of this emulſion he gives, during the intermiſſion, a pound or two every day, and ſays that, by this remedy, the recurrence of fits is prevented. He acknowleges, indeed, that certain fevers have reſiſted this remedy, and obliged him to have recourſe to the bark; but even then, with the decoction of the bark, he mixes the bitter emulſion. And he ſays alſo, that he had ſeen intermittent fevers frequently recurring, and which had entirely reſiſted the bark, at length entirely cured by the bitter emulſion alone. I have had ſo little opportunity in this country of practiſing upon intermittent fevers, or upon any but thoſe which readily yield to the bark, that I have never had occaſion to imitate the practice of BERGIUS; but if I were to have the opportunity, I ſhould certainly proceed with ſome caution in exhibiting ſuch quantities of the bitter almond.

THE ancients had an opinion, that bitter almonds taken before drinking wine would prevent this from cauſing ebriety; but JOHN BAUHIN, from experiments made on purpoſe, denies them to have this power.

CAMPHIRE.

THIS is a ſubſtance, whether chemically or medicinally conſidered, of a very peculiar nature.

THE chemiſts have ſubjected it to many experiments, and given us many particulars with reſpect to its chemical hiſtory; but I do not find that they have clearly aſcertained its compoſition, and I cannot indeed perceive that their experiments have any influence in the conſideration of it as a medicine. They have given us ſome inſtruction in the pharmaceutic treatment proper for its moſt convenient exhibition; but they have not given us any preparation of it that either increaſes or diminiſhes its powers with reſpect to the human body. I hold it therefore unneceſſary here to enter into its chemical hiſtory.

THIS ſubſtance, as we have it in our ſhops, and employ it in medicine, is obtained from a tree now ſufficiently known to our botaniſts, and diſtinguiſhed by the trivial name of Laurus Camphora. What we employ is chiefly the growth of Japan, though there are ſeveral other trees in the Eaſt Indies which afford the ſame ſubſtance. But as I do not know that the camphire obtained from theſe other trees is ever brought into Europe for the purpoſe of medicine, or, if they are, that they differ in the leaſt from that which we commonly employ, I do not think it neceſſary for me to proſecute the natural hiſtory of it further; nor is it anywiſe proper for me to ſpeak of the manner in which this ſubſtance is obtained from the trees affording it; of the different ſtates in which it is found and tranſmitted to Europe; or of the ſeveral operations by which it is brought into that form in which we have it in our ſhops.

THESE are particulars that may be of ſome curioſity with reſpect to chemiſtry and trade; but there is certainly no foreign drug ſo little liable to any variation or adulteration, or that comes into our hands ſo ſteadily and uniformly of the ſame appearance and qualities, and therefore requiring leſs of our acquaintance with its previous hiſtory.

WITH a view to its medicinal hiſtory, it may be proper to remark, that ſince we became acquainted with this peculiar ſubſtance from the Eaſt Indies, the chemiſts have ſuppoſed, that a ſubſtance preciſely of the ſame kind was to be found in many European plants. In many inſtances they have ſuppoſed this without any clear proof; but they have certainly, in ſeveral inſtances, demonſtrated its exiſtence in the cleareſt manner. It does not however ſeem neceſſary to enter into any enumeration of thoſe plants; becauſe, even in the inſtances in which the preſence of camphire is moſt clearly demonſtrated, it is even in theſe in ſuch ſmall proportion, that it has not given any modification of their ordinary virtues, or that theſe ſubſtances have been employed, or can be employed, as a medicine, for the purpoſes which camphire, in its ſeparate ſtate, is or may be employed.

After ſetting aſide ſo many particulars that might have entered into a treatiſe of camphire, it is time for me now to come to my proper buſineſs, which is the conſideration of camphire as a medicine. This I find to be a difficult taſk, as I muſt encounter the various and contradictory opinions that have been maintained with reſpect to it.

The oppoſition of opinions appears ſtrongly from hence, that the controverſy has been commonly brought into the ſingle queſtion, Whether camphire be a heating or a cooling medicine with reſpect to the human body? or, as I would put it in other words, Whether it is a ſtimulant or a ſedative power? The queſtion has been often attempted to be determined by frivolous and ill-founded theories, both on one ſide and the other; but theſe ſhall be here entirely neglected, as we judge the queſtion muſt be abſolutely determined by experiments made upon the human body, aſſiſted however by ſome analogy, wherever it can be ſafely drawn, from experiments on brutes.

To this purpoſe we remark, in the firſt place, that camphire taken into the mouth is of an acrid taſte; and though, by its evaporation, it excites a ſenſe of cold air, what remains is a ſenſe of heat in the mouth and fauces: and when taken down into the ſtomach, it often gives ſome pain and uneaſineſs, which we impute to the operation of its acrimony upon the upper orifice of that organ. Theſe may be conſidered as marks of its heating quality; and the ſame are more ſtrongly marked by its application to any ulcerated part, which it always evidently irritates and inflames.

These are indeed marks of a ſtimulant power; but hardly any thing correſponding to theſe appears upon its being thrown into the ſtomach of man or brute animals. It appears that in the ſtomach of animals it operates there by a ſmall portion of its effluvia; for when a maſs of any bulk has been thrown in, though it has produced conſiderable effects upon the body, neither the bulk nor weight of what had been thrown in are found to be ſenſibly diminiſhed: and in ſuch caſes it cannot be doubted that the operation has been entirely upon the nerves of the ſtomach, and by theſe on the reſt of the ſyſtem. This operation ſeems to me to be entirely that of a ſedative power; and we take its being of that kind on the ſtomach itſelf, which occaſions the indigeſtion of the food which has been conſtantly obſerved to follow its exhibition in any large quantity.

THE ſedative effects, however, are ſtill more evident and conſiderable in the ſenſorium. The death of ſo many animals, ſuddenly occaſioned by it, in the experiments of MENGHIN, can be explained in no other way but by the power of this ſubſtance, like that of other poiſons, in deſtroying the mobility of the nervous power, and thereby extinguiſhing the vital principle. It is in illuſtration of this that it ſo often operates by firſt inducing ſtupor and ſleep; and the other ſymptoms of delirium, furor, and convulſions, can all be probably explained as we have done with reſpect to other poiſons, by the ſtruggle that occurs between the force of the ſedative power and the reaction of the ſyſtem.

BUT before we go further, it is proper to enquire what are its effects on the ſanguiferous ſyſtem. And here at leaſt we can aſſert that it ſhows in the firſt inſtance no ſtimulant power. I regret, that in the account of the experiments on brutes that we have met with, there is no mention of the ſtate of their pulſe; but I think we have enough of experiments on men to aſcertain this matter. The experiments of HOFFMAN aſſure us, that the pulſe was not rendered more frequent, or the ſkin warmer, by twenty grains and upwards of camphire being taken into the ſtomach. The experiments of GRIFFIN and ALEXANDER rather ſhow that the frequency of the pulſe was diminiſhed by large doſes of camphire. To theſe we may add the experiments of BERGER, WERLHOFF, LASSONE, HOME, and eſpecially thoſe of COLLIN.

THE laſt, in giving ſome hundred inſtances of the exhibition of camphire in large doſes, even to the quantity of half an ounce in the courſe of one day, has not in any one inſtance taken notice of the frequency of the pulſe, or of the heat of the body being increaſed by it. In the caſe in which half an ounce of camphire had been exhibited, the patient was examined by the Baron VAN SWIETEN, and ſome other phyſicians, who could not miſs to have taken notice of its heating the body, if any ſuch effect had appeared. I myſelf have frequently given twenty grains of camphire, without ever finding the frequency of the pulſe increaſed by it, and ſometimes manifeſtly diminiſhed.

I ONCE had a maniacal patient, a young woman between twenty-five and thirty years of age, whom I was reſolved to try the cure of by camphire; and beginning by five grains for a doſe, and increaſing it by the ſame quantity every evening, I brought it at length to a doſe of thirty grains; and that doſe, in imitation of Dr KINNEAR, I repeated for four nights together: During all this I never found the frequency of the pulſe increaſed; and when the larger doſes were employed, the pulſe was frequently brought to be ten ſtrokes fewer in a minute than it had been before. At the ſame time, ſo little change was made in the ſtate of the mania, that I was reſolved to give up the trial; but the apothecary, by a groſs error in BADDAM's abridgement of the Philoſophical Tranſactions, was led to think that I had miſtaken Dr KINNEAR's practice, and had not carried the doſe of camphire ſo far as he had done. Proceeding upon this ſuppoſition, he preſumed to give forty grains of camphire for the next night's doſe. In about half an hour after this had been exhibited, I was ſent for to ſee my patient; who, after beating upon her breaſt, as if ſhe had felt ſome uneaſineſs there, had fallen down ſeemingly in a faint. She appeared to me quite inſenſible, with her pulſe very weak and hardly to be felt, and her breathing hardly to be obſerved, with a paleneſs and coldneſs over her whole body. I judged her to be dying; but by holding ſome ſpirits of hartſhorn to her noſe, and chaſing her extremities with warm flannels, ſhe was ſo far recovered as to ſwallow a little warm milk, and afterwards a little warm wine; and by theſe meaſures continued for two or three hours, her pulſe and the heat of her body were a good deal recovered, and ſhe had the appearance of being in a ſleep, in which ſhe was allowed to continue till morning, when ſhe came out of it by degrees, with her pulſe very much in its natural ſtate. At the ſame time the mania was alſo in the ſame ſtate as before, and continued to be ſo for ſome months afterwards, when I ceaſed to enquire after her.

DR HOFFMAN gives us the hiſtory of a perſon who, by miſtake, took at one draught two ſcruples of camphire, which occaſioned violent diſorder; but the operation was at firſt like that in the caſe above mentioned, a weakneſs and paleneſs of the whole body, which evidently ſhowed a ſedative operation.

FROM ſo many experiments directly in point, I ſhall be ſurpriſed if any body ſhall deny the ſedative and aſſert the ſtimulant power of camphire; and when I find QUARIN giving the following account: "*Vidi enim* (he ſays) *in multis, quibus cam-*" *phora majori doſi exhibita fuit, pulſum celerrimum, faciem ruberri-*" *mam, oculos torvos, inflammatos, convulſiones et phrenitidem letha-*" *lem ſecutam fuiſſe,*" I, who in a hundred inſtances of the exhibition of camphire, both in ſmaller and larger doſes, never ſaw ſuch effects produced, muſt think that either he or I had our ſenſes ſtrangely biaſſed by preconceived opinions of the ſtimulant or ſedative power of camphire. I am, however, the more diſpoſed to truſt to my own ſenſes, becauſe I have frequently had my fellow-practitioners concurring with me in the ſame perceptions.

BUT it is time for me to remark, that all obſervers are liable to ſome uncertainty and ambiguity in theſe matters. I am well perſuaded, that in the caſe of all poiſons which do not immediately and entirely extinguiſh the powers of life, there is a reaction of the ſyſtem which has a tendency to reſiſt and to overcome the power of the poiſon; and that this reaction operates in various ways, ſometimes in exciting the action of the heart and arteries, producing fever; ſometimes in exciting the energy of the brain, and producing convulſions; and probably in other ways which we do not clearly perceive or can explain. But it is enough that ſuch a power exiſts, and that its effects are often ſo mixed with thoſe of the poiſon, as to render it difficult, in moſt caſes, to determine what are the effects of the one or of the other, and has certainly occaſioned many phenomena to be imputed to the direct action of the poiſon, which are, however, purely the effects of the reaction above mentioned.

WE do not, however, venture upon aſſigning theſe effects more particularly, as I perceive that they are greatly diverſified, according to a variety of circumſtances; as, *1ſt*, the power and activity of the poiſon; *2d*, the quantity of it, and as it has been more or leſs ſuddenly introduced; *3d*, the ſize of the animal to which it is applied; *4th*, the conſtitution of the animal, as more or leſs powerful in reaction; and *5th*, according to the time which has been allowed for the operation of theſe circumſtances. This will perhaps remove ſome of thoſe difficulties which might otherwiſe have occurred.

IT particularly might be alleged in favour of the ſtimulant power of camphire, that in the animals which have been killed by large doſes of it, many of the viſcera have been found in a very inflamed ſtate; but I cannot allow this to have been the direct effects of the camphire: for there are no inſtances of this inflamed ſtate appearing in the animals killed ſoon after the taking in of the poiſon.

THE ſuddenneſs of the death, in many caſes, occaſioned by a direct action on the nervous ſyſtem, allows of no ſuppoſition of previous inflammation; and the ſudden recoveries which have ſometimes happened after very large doſes, aſſure us that in ſuch caſes no inflammation had been formed in any part of the body. It ſeems therefore certain, that inflammation is not the direct operation of this ſubſtance, and that the inflammation ſometimes found, as above mentioned, muſt be imputed to that agitation of the ſyſtem produced by the conflict that had ſubſiſted for ſome time between the powers of the poiſon and of the reaction.

IT is true that camphire ſhows a ſtimulant power in parts of great ſenſibility, as in the mouth, in the upper orifice of the ſtomach, and in ulcers where the nerves are laid bare; but there is no proof of its taking place in any other part of the ſyſtem:

and how little it is diſpoſed to operate in this manner, we may judge from hence, that, rubbed upon the ſkin in the moſt concentrated ſtate, it produces no redneſs or other mark of inflammatory action there; and we ſhall have occaſion to obſerve below, that it has a ſpecial power in taking off the inflammatory ſtate of the ſubjacent parts.

I HAVE thus endeavoured to aſcertain the operation of camphire in general upon the human body, and have eſpecially endeavoured to correct the moſt common opinion, that of its calefacient power; which I think has on many occaſions perverted the practice.

HAVING thus aſcertained the general operation, we are next to enquire what are the diſeaſes to which it is more eſpecially adapted. And in doing this, we find it difficult to repeat after practical writers, both on account of their different opinions with reſpect to the general operation, and with reſpect to the pathology of the diſeaſes in which they employ this medicine, as theſe different opinions very much affect their reports on this ſubject.

IT has been much employed in fevers of all kinds, particularly in nervous fevers attended with delirium and much watchfulneſs; and in ſuch I have frequently employed it with advantage. Some time ago, I have often ſeen it employed by my fellow-practitioners in ſuch caſes: and that the good effects of it did not always appear, I imputed to its being uſed only in ſmall quantities. Since we came into the free uſe of wine and opium, camphire has been little employed in the practice of this country. The uſe of it, however, has been very fully eſtabliſhed by ſome of the moſt eminent phyſicians on the continent. Among theſe I reckon the late learned and experienced WE[illegible]LHOFF, who often employed it in many inflammatory diſeaſes with great benefit, and plainly gives us his opinion in favour of its refrigerant power.

THE uſe of this medicine has been eſpecially remarkable in putrid fevers, of which indeed we have not many inſtances in this country: but from the very remarkable antiſeptic powers which it diſcovers in experiments out of the body, it is very probable that when thrown into the body in large quantities, ſo that at leaſt its more ſubtile parts may be diffuſed over the whole ſyſtem, it may be expected to produce conſiderable antiſeptic effects. Its power in reſiſting and curing gangrene in the experiments of COLLIN, are very remarkable; but whether that power be owing to its antiſeptic virtue alone, or to its operation at the ſame time on the nervous ſyſtem, I would not raſhly determine.

BOTH from its uſe in low, or what are called Malignant Fevers, and from its antiſeptic powers, it is highly probable that it has been of great ſervice in the confluent ſmall-pox. It is alſo likely that it may be of ſervice in favouring the eruption of exanthemata, and of bringing them back to the ſkin, when from any cauſe they had ſuddenly receded, though I have no particular experience of this.

THESE are the caſes of acute diſeaſes in which camphire has been uſeful; and its uſe in many chronic caſes is equally well authenticated. Whenever diſeaſes depend upon a mobility of the nervous power, and an irregularity of its motions, it may be expected that ſuch a powerful ſedative ſhould be of ſervice. Accordingly, many practitioners have reported its virtues in hyſteric and hypochondriac caſes; and I myſelf have had frequent experience of it.

In ſpaſmodic and convulſive affections it has alſo been of ſervice; and even in epilepſy it has been uſeful. I have not indeed known an epilepſy entirely cured by camphire alone; but I have had ſeveral inſtances of a paroxyſm which was expected in the courſe of a night, prevented by a doſe of camphire exhibited at bed-time; and even this when the camphire was given alone: but it has been eſpecially uſeful when given with a doſe of cuprum ammoniacum, of white vitriol, or of the flowers of zinc.

Since the report of Dr Kinnier, in the Philoſophical Tranſactions, Vol. XXXV. camphire has been often employed in caſes of mania; and I have given above an account of a trial which I had made of it. In that caſe, however, it was not ſucceſsful; nor in ſeveral other trials has it been more ſo with me or other practitioners in this country.

We have had here lately, in a patient under the care of Mr Lata ſurgeon, a notable example of the uſe of camphire in a maniacal caſe, which I think it proper to take notice of here.

A young man of ſixteen, ſeemingly of a ſound conſtitution, without any previous cauſe that could be aſſigned or ſuſpected, was affected with a loquacity very unuſual with him. It continued for ſome weeks, but at the ſame time with ſome confuſion of head gradually increaſing to ſomewhat of delirium; and theſe ſymptoms for ſome weeks went on gradually increaſing till the patient became quite maniacal, and ſo unmanageable as required his being tied down to the bed. In this ſtate, bleeding, bliſtering, vomiting and purging, and every other remedy that could be thought proper, were employed with great aſſiduity, without any effect however in moderating the diſeaſe. It was then thought proper to try camphire. He got it at firſt in doſes of five grains three times a-day; and this doſe was repeated every day, and increaſed by two grains till it came to be above ſixty grains, given three times every day. Whilſt the doſes were not more than two ſcruples, they ſeemed to have no effects either good or bad; but as the doſes were farther increaſed, they came by degrees to give more ſleep, and in the intervals of that to render the ſymptoms of the mania more moderate. And before the doſes came to be ſo large as I have mentioned, his ſleep came to be more and more, and his ſenſes came to be in the ordinary ſtate of health; and, with very little interruption, from an accident which we could account for, a very perfect ſtate of health has continued ever ſince, which is now for ſeven months.

This ſhows clearly enough the power of camphire in mania; and I have only to add, that though in ſeveral other inſtances it has not made a cure, it has not in any inſtance of a moderate doſe, that is, not exceeding half a dram, occaſioned any diſorder in the ſyſtem; and in ſeveral caſes it has induced ſleep, and rendered the mind for ſome time more quiet.

I observe that De Berger has been more ſucceſsful; and perhaps the reaſon of our failure has been our not attending to his admonition. In his letter to Werlhoff on the ſubject of camphire, he has the following paſſage: "*Multoties hoc remedio in mea praxi utor, præcipue in inflammationibus internis, magno cum ſucceſſu, et demiror tam multos medicos abuſu ejus interno abhorrere. Non diu eſt, quod præmiſſis præmittendis maniacum eo ſanitati penitus reſtitui. In eo vero momentum præcipuum ſitum eſt, ut ſufficiente doſi et diu ſatis exhibeatur.*"

THIS is particularly confirmed by a caſe given by JOERDENS in the *Commercium Norimbergenſe.* In ſeveral other writers there are accounts of maniacal and melancholic caſes cured by the uſe of camphire; but many of the practitioners who report ſuch cures acknowledge, that in many caſes it had diſappointed their expectations. Whether theſe failures have been owing to the not employing at the ſame time nitre, vinegar, and ſome other remedies which are ſuppoſed to contribute much to the virtues of camphire, we would not determine; but we are clear that mania is a diſeaſe of conſiderable diverſity with reſpect to its cauſes, and that there are certain caſes of it only to which camphire is properly adapted. In caſes of an organic affection of the brain, it is hardly to be ſuppoſed that camphire or any other remedy can be of uſe.

I HAVE mentioned above, that ſeveral practitioners have employed camphire in the moſt acute inflammatory diſeaſes; and therefore we are not ſurpriſed to find that it has been given alſo internally in caſes of acute rheumatiſm; and it is ſaid to have been with advantage. We have no experience of it, becauſe we have found another method of cure generally ſucceſsful; but I take this occaſion to mention its external uſe, as often of great ſervice in removing the rheumatic pains of the joints or muſcles. This we have often experienced, and have no doubt of camphire having a peculiar power in taking off the inflammatory ſtate in caſes both of rheumatiſm and gout. In the caſe of rheumatiſm it is a matter of common experience: in the caſe of gout it is more rare; but I have had the following particular example of it. A gentleman had brought from the Eaſt Indies an oil of camphire, a native ſubſtance, which ſeemed, by its ſmell and taſte, to be no other than camphire in that form, and which I perceive to be mentioned by naturaliſts as a native ſubſtance,

ſtance, produced by ſeveral trees in the Eaſt Indies. This the perſon poſſeſſed of recommended to all his acquaintances as an infallible remedy for gout and rheumatiſm; and a gentleman who had often laboured under the gout, and then felt the pains of it unuſually ſevere, was perſuaded to apply it. He had then the gout exceedingly painful in the ball of the great toe and inſtep of one foot. On this part he rubbed a quantity of the oil of camphire; and in about half an hour or a little more he was entirely freed from the pain he had before. In leſs, however, than an hour after, he had a pain and inflammation come upon the ſame part of the other foot. As the pain here became pretty ſevere, he again employed the oil of camphire, and with the ſame effect of ſoon relieving the pain very entirely. The conſequence of this was alſo the ſame; for in leſs than an hour the pain and inflammation returned to the foot that had been firſt affected: and here again our patient, obſtinate in perſiſting in the trial of his remedy, again applied the oil, and he had the ſame ſucceſs as before in relieving the part affected, and with the ſame effect alſo of occaſioning a tranſlation. But here the tranſlation being made to the knee, the patient abſtained from any farther application of the oil, and ſuffered the pain of the knee to remain for a day or two, and till it went off by ſome ſwelling and deſquamation in the uſual manner.

This hiſtory ſhows ſufficiently the power of camphire in relieving the inflammatory ſpaſm and pain of the part chiefly affected; but at the ſame time that it has no effect on the diatheſis of the ſyſtem, and that, when that ſubſiſts, as camphire is ready to occaſion a tranſlation, it will always be employed in gouty caſes with great danger. In caſes of acute rheumatiſm, we have had occaſion to remark, that a ſtrong ſolution of camphire in oil would relieve the pain of the joint for the time chiefly affected; but it was very often with the tranſlation of it to another joint ſoon after: and we have therefore long ago ceaſed from employing ſuch an application in all caſes when an acute rheumatiſm was very general and ſtrong in the ſyſtem.

It may be ſuppoſed that it is analogous to this power of camphire in taking off an inflammatory ſtate, that this medicine has been often found ſo uſeful in relieving toothach; and I have no doubt that camphire operates by the power mentioned in relieing toothach, but it is alſo by exciting a copious flow of ſaliva and mucus from the internal ſurface of the mouth, that water ſomewhat impregnated with camphire, employed to waſh the mouth, has been frequently of ſervice in relieving the diſeaſe.

However it may be with reſpect to toothach, we have no doubt that the antiphlogiſtic nature of camphire may be of uſe in curing ophthalmia: and this gives a good ground for the many attempts that have been made to introduce camphire into the medicines intended to be employed externally in the cure of ophthalmia.

We have now mentioned many of the virtues of camphire as employed by itſelf, and muſt now mention ſome inſtances of its peculiar utility when combined with other medicines.

When combined with draſtic purgatives, it is ſaid to moderate their acrimony, and thereby their violent operation. We have not indeed perceived this, and perhaps never tried it in a proper manner; but in the mean time, the reſpectable authority of Mr Lasonne the father ſatisfies me that it is well founded.

Another opinion that has been very general is, that camphire has the power of correcting the acrimony of cantharides. In oppoſition to this, we would not quote the facts given by

Dr HEBERDEN of two ſeveral inſtances in which camphire ſeemed to occaſion ſtrangury; for I muſt conclude theſe facts to have been very accidental occurrences, as I have employed camphire fifty times, even in large doſes, without my ever obſerving its having any effect upon the urinary paſſages. Mr LASONNE the father has obſerved, as I have done frequently, that camphire, though given very largely, never diſcovers its ſmell in the urine, whilſt it frequently does it in the perſpiration and ſweat.

IT was formerly a frequent practice in this country to anoint a bliſtering plaſter that was to be applied to the back, or other part, with camphorated oil, and this with a view of preventing ſtrangury from the cantharides. The practice however has been long ago laid aſide, becauſe it was perceived that, in moſt perſons, if the plaſter was allowed to continue applied for above twelve hours, and while at the ſame time it was omitted to give the patient a large quantity of drink, a ſtrangury would come on notwithſtanding the unction of camphorated oil, and even the exhibition of a quantity of camphire internally. The practitioners of this country have loſt their faith in the power of camphire in correcting the acrimony of cantharides; and for preventing the ſtrangury that might otherwiſe ariſe, they truſt entirely to a large exhibition of Arabic emulſion, and to the plaſter's not being allowed to lie on too long.

ANOTHER virtue aſcribed to camphire in combination, is its moderating the action of mercury; and if the ſaline preparations of mercury are triturated with a portion of camphire, this abſtracts a part of the acid that had been united with the mercury, and therefore renders the preparation more mild than before, and at the ſame time does not deprive entirely the preparation of much of its deobſtruent virtue. This we have had experience of in that very acrid preparation of mercury the turbeth mineral, and alſo in the mercurius dulcis or calomel, which, by being triturated with camphire, becomes leſs purgative, and leſs ready to excite ſalivation. How far this mitigation of the preparations of mercury leaves them equally powerful as before in the cure of ſyphilis, I cannot certainly determine; but am of opinion that it does not, if they be employed in the ſame quantities as they would have been before.

THIS mitigation of the ſaline preparations of mercury, by a combination with camphire, will be readily admitted; but many practitioners go farther, and allege that mercury, in every condition, united with camphire, becomes a more mild ſubſtance, leſs irritating to the ſyſtem, while it is equally powerful in curing the diſeaſes to which it is otherwiſe adapted. I muſt admit the experience of the practitioners of France in this matter, but thoſe of this country know nothing of it; and I can aſſert, that in many trials, a quantity of camphire added to our common mercurial ointment neither prevented the unction, in the uſual quantity, from exciting ſalivation, nor rendered the ſymptoms of it more mild than uſual.

A PECULIAR combination of camphire ſaid to have conſiderable effects, is that with opium. The employment of opium is in many perſons attended with ſome inconvenience and diſorder, as I have obſerved above; and every practitioner knows it to be alleged by ſome reſpectable perſons, that camphire joined with it prevents theſe diſorders. It may be ſo, but I have not found it in my experiments. I have found large doſes of camphire diſpoſe to ſleep, but commonly with that ſame confuſion of head and turbulent dreams which ſometimes ariſe from the uſe of opium; and I have not found that a ſmall quantity of camphire has any effects in increaſing the power of opium, or of rendering the operation of it different from what it would have been if employed alone. But againſt the reſpectable authorities of LASONNE and HALLE, I muſt ſuſpect that my experiments have not been made properly or often enough.

THERE is ſtill another inſtance of the improvement of a medicine by a combination with camphire. Mr LASONNE aſſures us, that camphire joined with the Peruvian bark gives it more energy and force, whether it be to be employed for the purpoſe of curing fever or gangrene; and I believe this to be well founded.

AFTER thus treating of the virtues of camphire, we muſt ſpeak of its doſe and exhibition. It will appear clearly from what is ſaid above, that it may be given in doſes of very different quantities; and it appears to me from many trials, that doſes of a few grains, repeated only after long intervals, have hardly any effect at all, and that, to obtain ſenſible effects from it, it muſt either be given in large doſes, not under that of twenty grains, or, if given in ſmaller doſes, theſe muſt be repeated frequently after ſhort intervals. The latter practice is preferred by ſome eminent practitioners. To what length in either way we may proceed, I have not experience enough to determine with any preciſion. From the effects of two ſcruples given in one doſe in the caſe narrated above, and in another quoted from Dr HOFFMAN, it would appear that ſuch doſes are violent and dangerous; but from ſome other experiments, it appears that larger doſes have been ſometimes given with impunity: and when it is given in divided doſes, it appears from COLLIN's experiments, that it may be given to the quantity of a dram, or two drams in the courſe of a day; and in one of his experiments it was given to the quantity of half an ounce: and the ſame will appear from the hiſtory which I have given above. It is probable that from large doſes only, conſiderable effects are to be expected; and as, from many experiments, it appears that the effects of camphire are not very durable in the body, it will be obvious that the repeated and long continued uſe of it may be neceſſary to the cure of ſeveral diſeaſes.

With reſpect to the exhibition of this medicine, it is, in the firſt place, neceſſary that it ſhould be always very minutely divided, as we know it is not readily diſſolved in the ſtomach; and while it remains there, it will float on the ſurface of the other contents, and in that way be applied to the upper orifice of the ſtomach, and give occaſion to ſome pain there. It ought therefore to be minutely divided before it be given; and this may be done by rubbing it firſt in a mortar with any dry powder, ſuch as nitre or hard ſugar: but to make certain of a minute diviſion, it is proper at the ſame time to add a few drops of rectified ſpirit of wine, or of other ſuch ſpirituous menſtruum as the ſpiritus vitrioli dulcis, or liquor anodynus mineralis of Hoffman.

It may alſo be divided by rubbing it with the mucilage of gum arabic; but this will alſo be more perfectly executed if the camphire is previouſly diſſolved by a little ſpirit of wine or expreſſed oil. By its being diffuſed in the mucilage of gum arabic, it may be again diffuſed in any watery fluid for more convenient exhibition; but it is to be obſerved, that camphire diffuſed in a watery fluid is ready to exhale from it, or ariſe to its ſurface, and to render the exhibition more diſagreeable. When, therefore, any large quantity of water in which camphire is diffuſed is to be prepared at once, it is proper to employ ſome means for entangling the camphire. Sugar alone does not ſeem to be ſufficient for the purpoſe; and it is more effectually done by triturating the camphire with mucilage alone, or with a portion of ſweet almonds, and diffuſing it again by means of mucilage into an emulſion.

IT has been thought that the virtues may be increaſed by exhibiting along with it a portion of nitre; but in many trials I have not been ſenſible of the benefit derived from the nitre, which, in any quantity that can be conveniently employed, has little effect on the ſyſtem. It is with more probability alleged, that vinegar exhibited with camphire is of ſervice. Vinegar certainly gives the beſt means of correcting the taſte of camphire, and ſeems even to render it leſs diſagreeable to the ſtomach; and we may allow that both by its refrigerant and antiſeptic powers, it may contribute ſomewhat to the virtues of the camphire.

THEA.

THIS is ſo univerſally an article of diet, that it deſerves to be conſidered very fully. Being ſo much however an article of diet, it may be ſuppoſed that we ſhould have treated of it in our firſt part; but as we cannot find it to afford any alimentary matter, and as its qualities give it the character of a medicine, we have reſerved it for this place.

WITH reſpect to it as a ſubject of natural hiſtory, or as an object of commerce, having had no good opportunity of being properly informed, I muſt abſtain from theſe diſcuſſions here, and muſt refer my readers to the information of the induſtrious Dr LETTSOME, who I believe has given it more fully and accurately than any other.

WITH reſpect to its qualities as a medicine, that is, its power of changing the ſtate of the human body, we might ſuppoſe it aſcertained by the experience of its daily uſe; but from the univerſality of this uſe in very different conditions of the plant, and in every poſſible condition of the perſons employing it, the concluſions drawn from its effects muſt be very precarious and ambiguous, and we muſt attempt by other means to aſcertain its qualities with more certainty.

To this purpoſe it appears, from the accurate Dr SMITH's experiments *De Actione Muſculari*, N° 36, that an infuſion of green tea has the effect of deſtroying the ſenſibility of the nerves, and the irritability of the muſcles; and from the experiments of Dr LETTSOME, it appears that green tea gives out in diſtillation an odorous water, which is powerfully narcotic.

THAT the recent plant contains ſuch an odorous narcotic power, we might preſume from the neceſſity which the Chineſe find of drying it with much heat before it can be brought into uſe; and that, even after ſuch preparation, they muſt abſtain from the uſe of it for a year or more, that is, till its volatile parts are ſtill farther diſſipated: and it is ſaid, that unleſs they uſe this precaution, the tea in a more recent ſtate manifeſtly ſhows ſtrong narcotic powers. Even in this country, the more odorous teas often ſhow their ſedative powers in weakening the nerves of the ſtomach, and indeed of the whole ſyſtem.

FROM theſe conſiderations we conclude very firmly, that tea is to be conſidered as a narcotic and ſedative ſubſtance; and that it is eſpecially ſuch in its moſt odorous ſtate, and therefore leſs in the bohea than in the green tea, and the moſt ſo in the more odorous, or what are called the finer kinds of the latter.

ITS effects, however, ſeem to be very different in different perſons; and hence the different, and even contradictory accounts that are reported of theſe effects. But if we conſider the difference of conſtitution, which occaſions ſome difference of the operation of the ſame medicine in different perſons, and of which we have a remarkable proof in the operation of opium, we ſhall not be ſurpriſed at the different operations of tea.

IF to this we add the fallacy ariſing from the condition of the tea employed, which is often ſo inert as to have no effects at all; and if we ſtill add to this the power of habit, which can deſtroy the powers of the moſt powerful ſubſtances, we ſhall not allow the various and even contradictory reports of its effects to alter our judgment, with reſpect to its ordinary and more general qualities in affecting the human body.

THESE, from the experiments above mentioned, and from the obſervations which I have made in the courſe of fifty years, in all ſorts of perſons, I am convinced that the qualities of tea are narcotic and ſedative.

IT has been often alleged, that ſome of the bad effects imputed to tea are truly owing to the large quantity of warm water which commonly accompanies it; and it is poſſible that ſome bad effects may ariſe from this cauſe; but from attentive obſervation I can aſſert, that wherever any conſiderable effects appear, they are in nine of every ten perſons entirely from the qualities of the tea; and that any like effects of warm water do not appear in one of a hundred who take in this very largely.

BUT while we thus endeavour to eſtabliſh the poiſonous nature of tea, we do not at the ſame time deny that it may ſometimes ſhow uſeful qualities. It is very poſſible, that in certain perſons, taken in moderate quantity, it may, like other narcotics in a moderate doſe, prove exhilirating, or, like theſe, have ſome effect in taking off irritability, or in quieting ſome irregularities of the nervous ſyſtem.

As its bad effects have been often imputed to the warm water that accompanies it, ſo we have no doubt that ſome of its good effects may alſo be aſcribed to the ſame cauſe, and particularly its being ſo often grateful after a full meal.

CROCUS.

THE natural hiſtory and preparation of this medicine is ſo commonly known, and delivered in ſo many books, that it is noways neceſſary to repeat any part of it here.

CHEMICALLY conſidered, it appears to be a very peculiar ſubſtance. It may be extracted by either ſpirituous or watery menſtruums, by wine or by vinegar; and each of theſe menſtruums take out the whole of its odorous, ſapid, or colouring parts. The tincture in ſpirit of wine does not become milky by the addition of water, and the tincture in water is not rendered turbid by the addition of ſpirit of wine. Its odorous part riſes in diſtillation, both with water and ſpirit; and it is alleged, that in the former caſe a portion of eſſential oil appears; but neither the quantity nor quality of this is well aſcertained.

ALTHOUGH the odorous part of ſaffron ariſes in diſtillation with either menſtruum, yet a great portion of fixed matter is obtained in the extracts; but the extract from water is very much changed from the nature of the entire ſaffron. That made with ſpirit of wine retains the ſenſible qualities of the ſaffron more entirely; but as there has been ſome diſſipation of the odorous and volatile parts, we can hardly ſuppoſe that the concentrated tincture, or extract of Dr BOERHAAVE, can contain the whole of the medicinal ſubſtance of the entire ſaffron.

IT ſeemed proper to give thus, as well as I could, the chemical hiſtory of this famous drug; but muſt remark, that from this chemical hiſtory we learn nothing towards pointing out or explaining its medicinal powers, nor indeed more from theſe than may be learned from its ſenſible qualities.

BY theſe, being of ſome acrimony both in ſmell and in taſte, it would ſeem that ſaffron might be very active with reſpect to the human body; but I have not been more puzzled upon any occaſion than in aſcertaining the medicinal qualities of this ſubſtance. The writers on the materia medica have conſtantly ſpoken of it as a very active medicine; but their reports of its effects are in ſome inſtances manifeſtly extravagant, though repeated by Dr BOERHAAVE himſelf; and very frequent experiments in practice do not at all ſupport the opinions that have been commonly entertained of it. I have given it in large doſes, without its ſhowing any ſenſible effects; hardly in any degree increaſing the frequency of the pulſe; and as anodyne or antiſpaſmodic, I have hardly obſerved its operation.

IT has been eſpecially famous for its ſuppoſed emmenagogue powers; and in one or two inſtances I have had ſome reaſon to believe in its power of this kind: but in many other inſtances, though repeatedly employed in large doſes, it has entirely diſappointed my expectations.

THE common accounts of its producing hilarity are ſtrongly contradicted by the account of Bergius, whoſe words are, "Nobilis matrona ſemper in triſtitiam illapſa eſt ingentem, "poſtquam pulveres crocatos ei propinaveram." And his words before, "Vidi hyſtericas quaſdam a propinato croco valde e-"motas," are more pointed in favour of its power than any thing I have otherwiſe learned. I have employed it in every ſhape, in ſubſtance, in tincture, and in BOERHAAVE's extract, and in larger doſes than authors have ever propoſed; but ſtill I have not diſcovered in it any conſiderable power or virtue.

IT does not appear that the London College had much faith in it, as they have omitted to give us any tincture of it. They have indeed retained it in the tinctura aloes compoſita, and in the pilulæ ex aloe cum myrrha, and in larger proportion than the Edinburgh College do; but I muſt obſerve that I have frequently prepared theſe compoſitions without any ſaffron at all, and at the ſame time could not diſcern any diminution of their virtues. But in thus diſparaging the virtues of ſaffron, I muſt acknowledge, that by a little attention, I have found the ſaffron of our ſhops to be often in a very imperfect condition, and therefore, that my experiments may have been ſometimes affected by this.

NYMPHÆA.

I REGRET this ſtanding in my catalogue, as it is now omitted in both the Britiſh diſpenſatories, and juſtly, as it has no virtue in its flowers; and though the roots have ſome aſtringency and bitterneſs, they have not ſo much as to deſerve any place in our practice, when we have ſo many ſubſtances more powerful for the purpoſes for which theſe might be employed.

WINE AND ALCOHOL.

IN the catologue of narcotic ſedative medicines I have ſet down *wine* and *alcohol*; becauſe it ſeems neceſſary to give them a particular conſideration here.

WINE I have formerly conſidered as a drink, and have there ſaid all that ſeemed neceſſary with reſpect to its preparation: and from the various cauſes of this we have endeavoured to explain its various conditions, particularly the different matters of which it may conſiſt; and, as depending upon theſe, the various ſenſible qualities that may appear in the different wines that are employed in our diet.

IN all this, which it ſeems unneceſſary to repeat here, I have ſuppoſed, that what conſtitutes a wine is its containing a portion of alcohol; but the effects of this in diet I took little notice of, and mentioned only the effects that might ariſe from the other matters which might accompany it in the different wines appearing upon our tables.

IT is, however, as containing alcohol that wines are to be conſidered as medicines; and the conſidering them as ſuch we have reſerved for this place, in which I have put them as narcotic ſedatives.

THAT alcohol is ſuch, can hardly be doubted; as, when only diluted with water ſo much that it can be ſwallowed, it ſhows the inebriating, intoxicating, and narcotic effects of other ſedatives. When taken in ſmall quantity, and much diluted, it does not indeed immediately ſhow its ſedative power; but, on the contrary, it may appear as a ſtimulant, cordial, and exhilarating liquor. As theſe operations, however, are in common to it with opium and other narcotics, they do not contradict our opinion of its proper ſedative nature.

As in wine the alcohol is never in large proportion to the water at the ſame time preſent; and as in wine the alcohol is alſo blended with matters which diminiſh the force of it; wine can be, and is commonly, employed as a ſtimulant, cordial, and exhilarating liquor, more conveniently than alcohol could be in any other way.

THIS explains why wine has been moſt commonly conſidered as a ſtimulant; but it is equally well known, that when taken to a certain quantity, it exerts all the ſedative powers of alcohol or opium: and its medicinal qualities, according to the quantities in which it is employed, may be either ſtimulant or ſedative.

WHENEVER, without fever, there is any languor or debility in the ſyſtem, wine can be employed in moderate quantity with great advantage; as in moſt perſons it is not only grateful to the palate, but alſo to the ſtomach: in which, if its aceſcent effects can be at the ſame time avoided, its cordial powers are immediately perceived, as from the ſtomach they are readily communicated to the whole of the ſyſtem.

THESE are the virtues of wine employed in moderate quantities: And it is to be remarked by the way, that by its particular operation on the ſtomach it excites the action of this, and thereby promotes appetite and digeſtion: and paſſing further into the inteſtines, it does not ſo readily as other narcotics ſuſpend the action of theſe and induce coſtiveneſs; but, on the contrary,

trary, by the mixture of its aceſcent parts with the bile, promotes the action of the inteſtines, and the evacuation by ſtool.

It may be further obſerved, that carried into the blood-veſſels, by the alcohol it contains it promotes perſpiration; and by the water and ſaline matters at the ſame time introduced, it certainly paſſes to the kidneys, and promotes the ſecretion of urine.

Wine may produce all theſe effects, though taken in no large quantities; and they may be referred entirely to its ſtimulant powers or aceſcent qualities, which are in ſo far very commonly ſalutary.

It is difficult however to ſet the limits between its ſtimulant and ſedative powers; and if the quantity of it be gradually increaſed, the latter gradually come on, and concurring with the former, produce at firſt a degree of delirium or ebriety, which is generally of the cheerful kind, and which occupying the mind, excludes all thoughts of care or anxiety: but the ſame ſedative power carried on ſtill further, renders the delirium more conſiderable, and gives that irregularity and confuſion of thought which is the ſtate of intoxication; and at length the ſedative power entirely prevailing, the animal functions, both of ſenſe and motion, are gradually weakened, and the perſon falls aſleep.

After thus detailing the ſeveral operations of both the ſtimulant and ſedative power of wine upon men in health, I proceed to mention their effects in the various circumſtances of diſeaſe.

In the firſt place, it will be obvious, that when the ſyſtem is under any irritation increaſing the action of the heart and arteries, the ſtimulant power of wine, even in the moſt moderate degree, muſt be hurtful: and as there is hardly any irritation more conſiderable or more permanent than inflammation ſubſiſting in any part of the body; ſo in all pyrexiæ produced by inflammation, wine muſt be particularly pernicious.

WE are alſo perſuaded that all active hæmorrhagies are attended with an inflammatory diatheſis; and therefore it will equally appear that wine is improper in ſuch caſes.

BUT we proceed no further on this ſubject of the uſe of wine in diſeaſes, as it may be governed upon the ſame principles we have laid down above with reſpect to opium; with this difference, however, that if the ſedative powers of either are to be ſought for, they are to be obtained more eaſily and certainly by opium than by wine; but where the ſtimulant powers of either are ſeparately, or as combined with the ſedative to be employed, the management may be more eaſy and accurate with wine than with opium.

ONE queſtion only on this ſubject remains to be conſidered, and that is, Whether alcohol, under any ſtate of dilution, can be properly employed in place of wine and opium? We are of opinion, that in many caſes it may; but that it will be always more difficult to ſeparate the ſtimulant powers of alcohol from its ſedative quality. In thoſe caſes, however, in which the ſtimulant powers are eſpecially required, as in the caſe of reſiſting gangrene, the diluted alcohol may be employed as properly as wine; and therefore in the caſe of poor perſons the former may be more convenient than wine.

CHAPTER VII.

REFRIGERANTS.

THESE are medicines ſuppoſed, as their title implies, to diminiſh the heat of the living body.

IN many trials made on purpoſe, it has not appeared to me that the ſuppoſed refrigerants diminiſh that temperature of the body which is the ordinary temperature of it in health; and therefore I am diſpoſed to define the refrigerants to be ſuch medicines as diminiſh the temperature of the body when preternaturally increaſed. It is eſpecially upon ſuch occaſions that their power is ſuppoſed and employed by phyſicians: and as the heat of the body, whether from internal or external cauſes, is never increaſed beyond its ordinary degree, but with an increaſed action of the ſanguiferous ſyſtem; ſo the refrigerants, as they diminiſh this increaſed action, are juſtly put under the general title of Sedantia; but being ſubſtances of quality and operation very different from thoſe ſedantia we have already conſidered, they are here to be treated of ſeparately.

IN what manner they produce their effects is not well aſcertained; and whether they act by diminiſhing the temperature of the body, as cold bodies, or thoſe of a temperature lower than that of the body itſelf do, or if they operate only by removing the cauſe of heat, has been a queſtion.

THE former opinion has been frequently ſuppoſed, and that from a particular conſideration. As the neutral ſalts, which are the refrigerants chiefly employed, do, upon being diſſolved in water, generate a conſiderable degree of cold; ſo it has been ſuppoſed that they may in like manner generate cold in our bodies, and therefore produce their effects as by an actual cold applied. See BROCKLESBY's Obſervations, p. 122.

THIS concluſion, however, will readily appear to be miſtaken, when it is conſidered that the cooling power of theſe neutral ſalts in water appears only during the time of their ſolution. When taken indeed undiſſolved, they may, as in BROCKLESBY's and ALEXANDER's experiments, generate cold in the ſtomach, and from thence have particular effects: but as after ſolution they produce no permanent cold; ſo, when taken in a diſſolved ſtate, as they commonly are, their refrigerant powers cannot be aſcribed to any actual cold applied.

THE concluſion drawn from their ſolution in water further appears to be very erroneous, from this; that acids, which are as powerfully refrigerant in the human body as the neutrals, do however, upon being mixed with water, always generate heat; and even the neutral ſalts, when any how deprived of the water neceſſary to their cryſtalline ſtate, do, upon that water's being reſtored to them, always generate heat. It is not therefore any thing in the nature of the ſaline matter that has a power of generating heat or cold in water or other bodies, but that the appearance of ſuch a power depends entirely upon the circumſtances of ſolution or mixture, and appears no longer than theſe circumſtances ſubſiſt.

IT is not therefore by an actual cold applied that our refrigerants diminiſh the heat of the living body; although in what other manner they do it may be difficult to explain.

WE are, however, here to venture upon a conjecture, which it is hoped may be founded; but whether it ſhall be or not, we throw it out as a conjecture only.

FOR this purpoſe I am diſpoſed to admit of a doctrine delivered by the late ingenious TURBERVILLE NEEDHAM, which ſeems to me to have been too little attended to in the phyſiology and pathology of the human body. We do not charge ourſelves with ſupporting the whole of Mr NEEDHAM's theories, or the applications of them which are oppoſed by SPALLANZANI; we only aſſume from him what we think he has demonſtrated in fact, that there is every where in nature an expanſive force and a reſiſting power; and that particularly under a certain degree of heat, the expanſive power appears in all the parts of organized bodies, in conſequence of which they ſhow a ſingular vegetating power; while at the ſame time, in other bodies, there is a power reſiſting and preventing the action of this vegetating power, and at leaſt of diminiſhing its force. See Nouvelles Obſervations Microſcopiques 1750, p. 229, 230.

THIS reſiſting power he actually found in thoſe ſaline bodies which we commonly ſuppoſe to be refrigerant powers with reſpect to the living body; and we hope that this doctrine may be applied to our purpoſe in the following manner. As heat is the great ſupport of expanſive force, ſo we ſuppoſe that every increaſe of heat is no other than an increaſe of the expanſive force in the heated parts; and from this we conceive it may be underſtood how reſiſting powers may diminiſh any preternatural expanſive force and heat in our bodies.

We thus endeavour to account for the refrigerant power of ſaline bodies; and the doctrine ſeems to be illuſtrated and further confirmed by this, that beſides organized bodies, there ſeems to be an expanſive force in all bodies diſpoſed to any fermentation. This ſeems always to begin by an expanſion of air from a fixed to an elaſtic ſtate; and it is very certain in fact, that by the contiguity of a ſufficient quantity of ſaline ſubſtances, that is of reſiſting power, the beginning of every fermentation is prevented. Such reſiſting powers have been often taken notice of as antiſeptic; but there is hardly any doubt that the more general term of Antizymic may be fairly applied to them.

IT may be proper to remark here, as not unheeded by us, that many other ſubſtances beſides the ſaline may perhaps come under the liſt of Antizymics: but whether they are ever alſo refrigerant with reſpect to the human body, or why they are not, we cannot here preſume to determine.

WHEN we have gone thus far in the theory of refrigerants, we judge it to be incumbent upon us to acknowledge that there are ſome difficulties which occur upon this ſubject, and which it is proper to lay before our readers.

THE operation of refrigerant powers, though we have ſuppoſed

poſed it different, ſeems in ſome reſpects to be analogous to the operation of actual cold applied. This not only changes the temperature of bodies, but in a certain degree proves a reſiſting and antizymic power. Its operation upon the body is attended with this peculiar circumſtance, that when applied in a moderate degree, and with no long continuance, it always increaſes the heat of the part to which it is applied; and from the redneſs which it at the ſame time produces, it is pretty certain that both effects are produced by its increaſing the action of the blood-veſſels in the parts. Its effects as a ſtimulant are upon no occaſion more remarkable than when any ſubſtance is taken into the ſtomach, of ſuch a temperature as to feel cold there; it commonly produces a ſenſe of heat on the ſurface of the body, and a diſpoſition to ſweat to be eaſily promoted, if at the ſame time the cold of the external air is by coverings avoided.

QUITE analogous to this is the action of our refrigerants when taken into the ſtomach; for though we have denied their producing any actual cold there, they always produce a determination to the ſurface of the body, and a diſpoſition to ſweat; which from the analogy mentioned, we are ready to aſcribe to a refrigerant power, or, if the expreſſion may be allowed, to a potential cold which they can produce. How this is to be reconciled to the refrigerant power which they are ſuppoſed to exert with reſpect to the whole ſyſtem, is not to be eaſily explained.

To our preſent purpoſe, however, it may perhaps be enough to ſay, that the ſtimulant operation of actual cold, which ſometimes occurs, will not be ſufficient to make us deny its power when longer continued, or frequently repeated, of diminiſhing the temperature of the body; ſo the ſtimulant power which our refrigerants frequently exert in the ſtomach will not be ſufficient to make us doubt of their refrigerant power with reſpect to the whole ſyſtem, which the experience of all ages has very certainly eſtabliſhed.

BEFORE going further it may be proper to obſerve, that the ſubſtances we ſuppoſe to be refrigerant are ſuch as act, not only by the potential cold we have alleged them to be endowed with, but at the ſame time by other operations that may be ſuppoſed to contribute to their general effects of diminiſhing the action of the ſanguiferous ſyſtem. Theſe operations are their being laxative in the inteſtines, and diuretic in the kidneys; and we are diſpoſed to judge their relaxing a febrile ſpaſm on the ſurface of the body to be another means of their concurring to their general effect.

WHATEVER therefore may become of our theory, or however difficult it may be to overcome the doubts above mentioned, the ſtate of facts, from the experience we have aſſerted, may, we judge, be ſufficient ground for our proceeding now to conſider the qualities and effects of the ſeveral refrigerants enumerated in our catalogue.

PARTICULAR REFRIGERANTS.

AT the head of the liſt of refrigerants, I have ſet down ACIDS; and although theſe might come under ſome other of our general titles, I ſhall here conſider all their ſeveral powers and virtues, or nearly the whole of their medicinal hiſtory.

IT might be expected that I ſhould here, in the firſt place, enumerate all the ſeveral ſubſtances which may be, and generally are, comprehended under the general title; but this I find would be a difficult, and we hope it is an unneceſſary work. The chemiſts of late have been diſcovering a great number of different ſpecies of acids that were not known before; and it is probable that their inquiries are not yet finiſhed; but in the mean time, it appears, that although it was very proper for the purpoſes of chemiſtry to mark and aſcertain the diverſity of acids, yet as few of the whole number have been employed as medicines, and that we are at leaſt uncertain how far ſeveral of them may be employed as ſuch, it does not ſeem neceſſary for us to take notice of any but thoſe which we know to have been employed in the practice of phyſic.

IN doing this, we ſhall in the firſt place mention the medicinal qualities which we ſuppoſe to be in common to all the ſpecies of acid employed in phyſic; and ſhall afterwards conſider how far theſe qualities may be anywiſe different in the particular ſpecies.

UPON this plan, the quality firſt to be mentioned is that of their refrigerant power. This we ſuppoſe to be eſtabliſhed by the experience of all ages; and practitioners ſtill conſtantly employ them in every caſe in which the heat of the body is preternaturally increaſed; and although there may be ſome of the other qualities of acids which may not be ſuited to the conſtitution of certain perſons, yet as to this quality there are hardly any exceptions in the caſes of fevers, inflammations, and hæmorrhagies.

THESE effects, however, are not very evident to our ſenſes, nor are eaſily ſubjected to experiment; becauſe they cannot be remarkable in conſequence of any one exhibition; and the effects are only found in conſequence of frequent repetitions. It is proper, therefore, that we ſhould confirm it by other obſervations.

ONE is, that any preternatural heat ariſing is accompanied with thirſt; which eſpecially directs to the choice of acid: and as inſtincts may be commonly ſuppoſed to be ſuited to the purpoſe of the animal œconomy, ſo this deſire of acid is preſumed to be a proof that theſe are ſuited to moderate the heat that is the cauſe of thirſt.

ANOTHER conſideration may be, that acids eſpecially abound in warm climates and warm ſeaſons; and therefore, that nature has made this proviſion of what is ſuited to moderate the heat of the human body, ariſing in ſuch climates and ſeaſons.

To all this I would add the antizymic power of acids, as this oppoſes the expanſive force of heated blood: and as we have reaſon to ſuppoſe that the blood is more readily heated as it is more diſpoſed to putreſcency, ſo the well known antiſeptic power of acids is particularly ſuited to temper that increaſed heat; and therefore, after all theſe conſiderations, there can be no doubt that acids are particularly ſuited to act as refrigerants in the human body.

ANOTHER quality of acids in general is their aſtringent power, which we have taken notice of and explained above. This power however appears only in weak or diluted acids; for in a more concentrated ſtate they prove corroſive, as we have alſo obſerved above. Indeed we conceive that it is eſpecially when their corroſive power is weakened, though ſtill approaching to it, that another quality appears; which is, that they become painful and pretty powerfully ſtimulant, in ſo far that they are uſeful in ſome caſes of palſy.

IT is however to be remarked, that it is very doubtful if their ſtimulant power can always be in this way explained; for it ſometimes appears in the operation of the weaker or more diluted acids. Thus acids may quench thirſt by their refrigerant power; but it is probable alſo that they, by their ſtimulating the excretories of the mouth and fauces, pour out their fluids more copiouſly. I mention this ſtimulus of the mouth and fauces here, to introduce another conſideration to be next taken notice of; and which is, that the ſame ſtimulus applied to the ſtomach excites appetite, and, by increaſing the tone of the ſtomach, promotes digeſtion.

AFTER mentioning ſo much of the power and virtues of acids in general, there remains a queſtion, What are their effects when carried into the blood-veſſels, and there mixed with the maſs of blood? As to this I would aſſert, that the concentrated foſſil acids cannot be carried into the maſs of blood but in ſuch a diluted ſtate as muſt deſtroy entirely their coagulating power, and therefore that their effects in that way cannot be ſuppoſed or apprehended.

THIS neceſſarily leads to the queſtion, In what ſtate are the foſſil acids when mixed with the maſs of blood? In anſwer to this we obſerve, but for what reaſons we cannot explain, that they do not enter into the compoſition of the animal fluid, as we have alleged and maintained above on the ſubject of acid as an alimentary matter. And here we have only to obſerve, that as they do not enter into the animal mixed, they make a part of the ſeroſity; and therefore, in paſſing with that by the excretions, they may ſhow their ſtimulant power. At the ſame time, as a part of the ſeroſity, they may, in paſſing by the ſkin, ſhow there ſome diaphoretic effects, or, in paſſing by the lungs, ſhow ſome irritation there; but it is probable that they paſs chiefly by the urinary paſſages, and therefore ſhow their diuretic powers more readily than in any other way.

THESE are the effects of acids in general; and we now proceed to conſider how far theſe effects are anywiſe varied in the different ſpecies.

VITRIOLIC ACID.

THIS is the acid that we can have in the moſt concentrated ſtate, and therefore the moſt fit to be employed as a cauſtic, or, when properly diffuſed, as a ſtimulant. For the latter purpoſe it is commonly diffuſed in ſome unguinous ſubſtance, as the hog's lard; but it may be more properly diffuſed in a more liquid oil, as in this it may be more equally diffuſed than in the thicker matter. When it is to be employed for internal uſe, it muſt be largely diluted with water; and the diſpenſatories have ordered ſeven or eight parts of water to be added to one of the concentrated acid. The proportion of water is not a matter of much nicety; but it is proper for the ſake of preſcribers that it ſhould be fixed, which, however, cannot be done without determining the ſpecific gravity of the concentrated acid, which neither of the colleges have done.

THE diluted acid is ſeldom employed in any preciſe doſe, but mixed with water, or with tinctures or infuſions, in ſuch quantity as the patient's palate will eaſily bear. This however is a very inaccurate practice, as it generally occaſions the doſe of the acid to be too ſmall. In my opinion, it would be better to fix the quantity of acid, and leave it to be diluted to what the patient's palate may require.

IT has been long a common practice of mixing this acid with a quantity of ſpirit of wine, and in the mixture infuſing ſome aromatics; but this is alſo a very inaccurate practice, as neither the ſpecific gravity of the rectified ſpirit, nor of the vitriolic acid, are anywiſe determined. I would however take no pains to rectify this preparation, as I could never find the addition of the aromatic to improve the medicine; and while the practitioner is always left uncertain with reſpect to the quantity of acid employed, I have almoſt always found that this aromatic elixir was leſs agreeable than the ſimple acid.

THE ſimple acid properly diluted, and ſweetened perhaps with a little ſugar, is generally grateful to the palate, and is of ſervice in quenching thirſt. When it is carried down into the ſtomach, it is uſeful in curing the nauſea which ariſes from any putrid matters there; and either by this means, or by its ſtimulus applied to the ſtomach, it excites appetite, and conſequently promotes digeſtion.

I HAVE never found that, in any quantity, the vitriolic acid mixed with the bile proved laxative, as the vegetable acids ſo readily do. What may be its effects in the blood-veſſels we have ſaid enough when treating of the effects of acids in general. What are the virtues of this acid in giving the æther vitriolicus, we reſerve to be ſpoken of on the ſubject of antiſpaſmodics.

NITROUS ACID.

THIS acid, from its being ſo commonly employed in chemical operations under the title of Aquafortis, has probably, from the opinion of its corroſive nature, prevented phyſicians from employing it as a medicine. This however was a miſtake; for this acid, properly diluted, may be very ſafely employed, and has all the powers and virtues of acids in general. Though the inſtances are few, there is one in **Boerhaave**'s *Nitrum Nitratum*, in which the acid is in greater proportion than is neceſſary to ſaturate the alkali; and I have frequently employed it as a grateful and cooling medicine.

There is another inſtance in which the acid of nitre is alſo employed, and that is in the ſpiritus nitri dulcis. If this was properly prepared, it ſhould contain no acid; but this is not commonly the caſe, and the vulgar practitioners commonly employ it as a diuretic medicine, which it cannot be but by the quantity of acid it contains, and which therefore ſhows this acid to be frequently and ſafely employed; but it is hardly neceſſary to obſerve, that in this way it can never with any accuracy be employed.

The employment of the nitrous acid, as producing æther, ſhall be conſidered in another place.

Muriatic or Marine Acid.

In the laſt century **Glauber** took great pains to introduce the uſe of this acid, aſcribing many virtues to it both in diet and medicine; but in both he was extravagant and incorrect, and therefore he has not been much followed. It happened, however, that phyſicians employed it a good deal in the diſeaſes of the ſtomach; and many have been of opinion, that in reſtoring the tone of the ſtomach, it operates more powerfully than the vitriolic: but as the latter can be more eaſily brought to a ſtandard than the other, it has entirely thrown this other out of our practice. Although the London college, in the laſt edition of their Diſpenſatory, have omitted both the ſimple ſpirit of ſalt and the ſpiritus ſalis dulcis, yet the Edinburgh college have retained both: and wherever the latter is employed, I conſider it as an employment of the acid; for, in the ordinary preparation of it, the qualities of the acid are never entirely deſtroyed.

But the moſt remarkable inſtance of the employment of this acid was in the tinctura aperitiva moebii, which Dr Hoffman informs us was, in the courſe of the laſt century, much employed and celebrated for its virtues. Dr Hoffman informs us that it conſiſted of a ſolution of common ſalt ſuperſaturated with its acid. I have frequently employed it by making a ſolution of half an ounce of good bay ſalt in four ounces of water, adding to this two drams of a well-rectified ſpirit of ſalt; and this given in a tea ſpoonful or two in a glaſs of water I have found uſeful in improving appetite, and frequently in ſtopping vomiting.

Vegetable Acids.

These I am to conſider as of three kinds; the native, the diſtilled, and the fermented.

The native acids are chiefly thoſe found in the fruits of plants, ſometimes however alſo in the leaves and roots. They are in different degrees of acidity, and different by the texture of the fruit in which they are lodged; and ſtill more conſiderably by the various matter adhering to them, both in the fruits and in the juices expreſſed from theſe.

The effects of theſe different conditions in the uſe of them as aliments I have endeavoured to explain when treating of them above; but, as medicines, I do not find that I can apply any diſtinction of them. Although they may be diſtinguiſhed in a chemical view, I do not find that I can apply ſuch diſtinctions to the purpoſes of medicine; and that, with a view to this, I muſt conſider them in general, and merely as acids. In conſidering them therefore as medicines, I muſt obſerve, in the firſt place, their refrigerant power; and that, eſpecially upon account of the quantity in which they may be given, they are the moſt effectual of any we can employ. As we have ſaid above, that they enter into the compoſition of the animal fluid, and thereby diminiſh the putreſcent tendency of this, they therefore, as I judge, obviate the heat that might otherwiſe ariſe; and it is in proof of all this that they are the moſt ready and certain cure of ſcurvy.

THE ſame acids are never in ſuch a concentrated ſtate as to ſhow any cauſtic or even ſtimulant powers; but they ſhow readily the ſtimulant power which is in the weaker or much diluted acids, ſo far as they excite appetite and promote digeſtion: and probably it is by the ſame power that they excite the urinary excretion.

ALL theſe powers are to be aſcribed to the pure acid that is in this native acid of vegetables; but it is now to be remarked, that in all of them, even the moſt purely acid, there is preſent a quantity of fermentable matter: and if this happens to be in large proportion, or even in ſmall proportion, and thrown into ſtomachs of an aceſcent diſpoſition, the acid undergoes a fermentation, which is attended with flatulency, a more powerful acidity, and all the other ſymptoms which we term Dyſpeptic. This does not however much affect their refrigerant power, or do much harm to the ſyſtem, except in thoſe caſes of gout and calculus renalis, in which the taking down the tone of the ſtomach may be very hurtful. It ſeems to be in conſequence of this aceſcent diſpoſition of the ſtomach that a more copious acidity, and perhaps of a peculiar kind, united with the bile, forms a laxative which may occaſion more or leſs of diarrhœa, and the cholic pains which ſo frequently accompany the operation of laxatives.

Distilled Acid of Vegetables.

All vegetables except muſhrooms, if theſe be truly ſuch, when treated by diſtillation without addition, give out, in the firſt part of the diſtillation, a quantity of acid, and continue to give out more during the whole of the diſtillation. This acid is ſomewhat different according as it is drawn from different vegetables: but that difference has not been aſcertained; and we know them even in chemiſtry, and more certainly in medicine, only by the common quality of acid.

This acid has been but little employed as a medicine, and has hardly been remarkable but by its late uſe in the form of tar-water. In making tar, it is exhaled from vegetables whilſt they are burnt, in the ſame manner as in the diſtillation above mentioned; and accordingly, in the making of tar, an acid water is found in conſiderable quantity in the ſame ditches that are prepared for receiving the tar during the burning of the wood. In the countries where tar is prepared, particularly in North America, this acid was accidentally employed as a medicine. It was found to prove very uſeful; and the benevolent and worthy Biſhop Berkeley being informed of this, was deſirous of rendering ſuch a medicine very generally known. But as the water collected, as we have ſaid, during the burning of the wood, could not properly or conveniently be obtained in Britain, he perceived that a quantity of the acid remained in the tar as it was imported, and perceived that it might be extracted from it by infuſion in water. It is ſuch an infuſion that gives the celebrated tar-water which has been ſo often uſed ſince.

IT was at firſt by many perſons celebrated as a very valuable medicine; and from my own obſervation and experience, I know it in many caſes to be ſuch. But, as happens in all ſuch caſes, the commendations of it by the patrons and favourers of it were very often extravagant and ill founded; and though the perſons who diſparaged it had ſome foundation for their opinions, yet they alſo told many falſehoods concerning it.

ALTHOUGH it would have been difficult, at that time, to balance between theſe oppoſite accounts; yet, in the courſe of ſixty years, the matter has found its own balance. The exceſſive admiration of it has entirely ceaſed, and the moſt part of practitioners, from cauſes we could aſſign, have neglected the uſe of it; but there are ſtill many judicious perſons who believe in and employ its virtues. In many inſtances this preparation has appeared to ſtrengthen the tone of the ſtomach, to excite appetite, promote digeſtion, and to cure all the ſymptoms of dyſpepſia. At the ſame time it manifeſtly promotes the excretions, particularly that of urine; and the ſame may be preſumed to happen in that of others. From all theſe operations it will be obvious, that in many diſorders of the ſyſtem this medicine may be highly uſeful.

IT may be however, and has been a queſtion, upon what, in the compoſition of tar-water, theſe qualities depend: and I have no doubt in aſſerting that it is entirely upon the acid produced in the manner above mentioned. Mr Reid, the author of a diſſertation on this ſubject, has rendered this ſufficiently probable, from the accounts of GLAUBER and BOERHAAVE with reſpect to the virtues of ſuch an acid, and from the opinion of the Biſhop of CLOYNE in preferring the Norway tar to that of New England, as the acid part is not taken from the former ſo entirely as it is from the latter; and he alſo properly ſupports it by this, that any other parts of the tar-water which may be found in it, unleſs carefully ſeparated, are commonly very hurtful.

UPON the firſt introduction of tar-water, ſome phyſicians were of opinion, that it derived part of its virtue from ſome oily matter in its compoſition; but it would not be difficult to ſhow, that this, in many reſpects, is very improbable, and that, upon the contrary, the preſence of theſe oils, as Mr Reid has particularly pointed out, is frequently pernicious. But, to ſuperſede all controverſy on this ſubject, I can aſſert from much experience, that the tar-water, as it abounds in acid, and is more free from all oily matters, is the moſt effectual medicine: and I have this clear proof of it, that when, inſtead of extracting the acid by infuſing the tar in water, I procured it by diſtillation from ſolid fir or other woods; and, by taking only the firſt part of the diſtillation, I obtained the acid as free as poſſible from all oily matter. I found that by employing this acid as a medicine properly diluted with water, every virtue appeared that was ever found in any tar-water. In this practice I found a particular advantage, as I could, by a proper rectification and concentration, bring the acid into a ſmall bulk; which being readily portable, is, on occaſion of journeys, or other circumſtances, rendered very convenient. But it is very neceſſary to obſerve here, that this acid, to be rendered a very uſeful remedy, muſt be always largely diluted with water; and how much the water may favour its operation in every reſpect will be ſufficiently obvious.

FERMENTED ACID of VEGETABLES.

THIS is the well-known liquor named VINEGAR, the preparation of which needs not be given here. As it is found in our houſes and ſhops it is in different conditions, the cauſes and circumſtances of which are not well aſcertained; and we can only judge of its purity by the ſharpneſs of its acid taſte, and its being free from all others.

As this acid is prepared by fermentation, it is always in a diluted ſtate; and, both for the purpoſe of medicine and of pharmacy, it has been deſired to be obtained in a more concentrated condition. The purpoſes and the execution of this are various; but the moſt ordinary practice has been by diſtillation, which ſeems to me not to be the moſt proper: for the diſtillation cannot be practiſed without the acids becoming empyreumatic, which always renders it a diſagreeable medicine; and at the ſame time, by the ordinary practice, the acid is hardly or not at all rendered ſtronger than it might have been by a proper fermentation. The directions of the London College I could never follow with any exactneſs; and I have always found, that before the aqueous part be drawn off, an empyreuma is communicated to the whole liquor.

THE Edinburgh directions may be exactly executed; but the empyreuma is made very ſtrong, and at the ſame time the diſtilled acid, as I have ſaid, is hardly ſtronger than it is in good vinegar; and I know of no advantage that this diſtilled acid has over the other.

IF a concentrated vinegar is much to be deſired, there are two other ways of obtaining it. The one is by freezing, which has now been frequently practiſed in the northern countries of Europe; and the management of it is preſcribed in many books of chemiſtry, that I believe are almoſt in every body's hands.

THE other means is by a diſtillation from any neutral containing this acid, by the addition of a ſtrong vitriolic acid. This gives a very volatile acid, which by its volatility may be applied to ſeveral purpoſes; and by its being in a concentrated ſtate it may be, by a proper dilution, applied to every purpoſe of medicine that the fermented acid of vegetables is fit for.

IT is true that this diſtilled acid wants ſome ſubſtances which are joined with it in the vinegar prepared by fermentation; and Dr BOERHAAVE inſinuates that ſome virtues may be derived from theſe. I have not however truly perceived them; but allow, that if there are any ſuch advantages to be deſired, they may be more certainly obtained by employing the vinegar concentrated by freezing.

AFTER theſe remarks upon the different management of this acid, I proceed to conſider its virtues. It is certainly a refrigerant power, which we conclude both from experience and from its antiſeptic powers; and it has this advantage over the foſſil acids, that it can be thrown in, in much larger quantity, and with more effect, as it enters into the compoſition of the animal fluid. It is grateful to the palate and ſtomach, and certainly ſtimulates the latter ſo far as to excite appetite. By the ſame ſtimulant power it acts upon the mucous excretories of the mouth and fauces; and at the ſame time it ſeems to act as an aſtringent on the blood-veſſels of theſe parts, and proves uſeful in the inflammatory affections of them. When it is carried in large quantity into the blood-veſſels, a portion of it paſſes off by the excretions, and proves manifeſtly diuretic. It is celebrated alſo for its diaphoretic and even ſudorific virtues; and theſe are commonly aſcribed to its power of diſſolving the fluids. But this, upon the general principles which will be explained hereafter, we muſt deny; and if it ever has appeared to have this effect, we muſt impute it to its refrigerant powers in the ſtomach, and its gently ſtimulant powers in the whole ſyſtem, aſſiſted by a ſudorific regimen.

A SINGULAR power has been aſcribed to this acid, and that is, in preventing and curing obeſity, juſtly I believe in both caſes; and I hope that I have above explained the theory of it. We have alleged that the oily matters taken into the body do not remain in their oily form, but are, in the firſt place, incorporated with the proper animal fluid, and are afterwards ſeparated by a peculiar ſecretion, and depoſited in the adipoſe membrane. This union of oil with the animal fluid we aſcribe to the acid taken in as a part of our food; and it will be obvious, that according to the quantity of this, the oil will be more intimately united and fitted to paſs off by the excretions, and leave leſs therefore to be depoſited in the adipoſe membrane. But farther, as we have alleged above that the oil already depoſited in the adipoſe membrane is again conſumed by every acrimony prevalent in the blood, ſo a ſuperabundance of vinegar in that maſs may have a ſhare in this conſumption.

THIS is all pretty well aſcertained by obſervations upon the large uſe of vinegar; but lately a new fact has been preſented to us.

A GENTLEMAN diſpoſed to obeſity found, that by his abſtaining from wine, which I take to be the ſame as abſtaining from the fermented acid of vegetables, he loſt his fat very conſiderably; but returning again to the uſe of wine, his obeſity ſoon alſo returned, and was again removed by the ſame means as before. I ſhall not attempt the theory of this till we ſhall be farther informed of ſuch caſes, and more exactly with reſpect to the circumſtances of them.

ACID of MILK.

THERE is perhaps another ſpecies of vegetable acid to be taken notice of, and that is the acid which ſo often, and in certain circumſtances, ſo conſtantly appears in the milk of all phytivorous animals. As, in the milk of the ſame animals, a quantity of ſugar is conſtantly preſent, we may ſuppoſe it to be no other than a fermented acid of ſugar; but ſome difficulty occurs on this ſubject, as the fermentation which produces an acid in milk, takes place more ſuddenly than we could expect it to happen in any ſolution of ſugar, and, as was obſerved above, continues for a long time to increaſe the acidity produced. We are therefore perſuaded there is ſomething peculiar in the fermentation which produces the acid of milk; but what this peculiarity conſiſts in, or what effects it has on the nature of the acid produced, we cannot diſcover. It may perhaps deſerve particular conſideration, both in chemiſtry and medicine, but we have not yet learned what application in either way may be made of it; and in the mean time can only ſay, that the acid of milk, both in the good effects it can produce, and the noxious qualities it may, upon occaſion, diſcover, are the ſame we have pointed out as ariſing from the native or fermented acid of vegetables.

A VEGETABLE acid prepared by fermentation might ſtill be mentioned, which is that of tartar; but I think it will be more properly conſidered under the next title of Neutral Salts, or afterwards under the title of Laxatives.

WE have now mentioned moſt of the acids that are well known in the practice of phyſic; but I muſt own that there are many others which have been ſometimes employed, and may I believe deſerve to be inquired after, but I own that I find the facts too few to determine the matter clearly, and at leaſt that I am too little acquainted with theſe facts to be able to ſpeak poſitively on the ſubject.

OF the large liſt that might be mentioned, the only one that I am diſpoſed to take notice of is the

ACID OF BORAX.

THIS was the invention of the celebrated HOMBERG; and, as he imagined it to be poſſeſſed of ſtrongly ſedative powers, he gave it the name of the SEDATIVE SALT. Upon ſuch an authority it was introduced into practice; and ſuch is the favour for a new medicine, and ſuch are the excuſes ſo readily found for its failure, that it ſoon came to be much employed in France; and Mr GEOFFROY having found a cheaper method of preparing it, the Government ordered, at their expence, that it ſhould be furniſhed to all the medicine cheſts of the army and navy.

THIS certainly gave an eaſy opportunity of trying its virtues; but we have hardly ever had any favourable reports of theſe from France, or from any other country of Europe: and it appears that the practice with it has ceaſed every where; and long ago Monſ. de la Mettrie has, in diſparagement of our art, obſerved, *Que le ſel ſedatif n'eſt pas auſſi ſedatif qu'autre ſoi.* To all this I could add my own experience, which has ſhown me, that even in large doſes this ſalt has no effect on the human body.

Neutral Salts.

The next ſet of refrigerants in my liſt are the neutral ſalts; and theſe, with acids, are certainly the refrigerant remedies we chiefly depend upon in practice. The refrigerant power ſeems to be in common to every neutral, ſo far as we have yet tried them, except thoſe neutrals compoſed of the muriatic acid and foſſil alkali, and perhaps ſome other acids which carry into the compoſition of neutrals ſome other matters of an acrid kind: but theſe are not well aſcertained; and we take it for granted that it is of the nature of a neutral ſalt, compoſed of an acid and alkali, with the exception mentioned, to give a refrigerant ſubſtance.

This power in theſe ſalts is a matter of common experience, and may be preſumed from their antizymic and antiſeptic powers; but in what proportion it is in the ſeveral ſpecies, is not exactly aſcertained, though Dr Smith, in his experiments, has done ſomewhat to this purpoſe. In the Doctor's experiments it appears, that, except in common ſalt, ſome ſedative power in every one takes place. In theſe, indeed, compoſed of the foſſil alkali, ſome ſtimulant power appears upon their firſt application; but ſoon after this, their ſedative power becomes manifeſt by their deſtroying the irritability of the part. After all, however, I cannot apply theſe experiments ſo as to explain the reſpective powers of theſe ſalts as they appear in the practice of phyſic. It appears here, that all of them which ſhow a ſedative power in Dr Smith's experiments, when thrown into the ſtomach, produce a diſpoſition to ſweat, which we refer entirely, as we have explained above, to their refrigerant power in the ſtomach; and in what proportion this is I find it difficult to aſcertain.

certain. The prejudices of practitioners at preſent are in favour of the neutral formed of the native acid of vegetables with the fixed vegetable alkali; and while this is the moſt agreeable, I have no objection to its being the moſt commonly employed in practice: But I make theſe obſervations to ſhow country practitioners, that when they happen to be in want of lemon juice, they may employ any other acid except the muriatic to form neutrals that may anſwer the ſame intentions; and a very little chemiſtry will teach them every thing elſe that may be here neceſſary. In the time of our laſt wars upon the Continent, our practitioners frequently employed the vitriolic acid, and which was indeed employed in making the original antiemetic draught of RIVERIUS.

WITH regard to particular neutrals, I have a few obſervations only to make. I have ſaid juſt now, that the vitriolated tartar may be employed as a refrigerant; and as it is thereby diaphoretic, it is employed in the compoſition of DOVER's powder.

THE ſal mirabile is almoſt only employed as a purgative; but that it has refrigerant powers, appears from the inteſtines being left, after the operation of this purgative, in a lax and flatulent condition.

WHAT is named the ſecret Sal-ammoniac is little employed in practice; but there is no doubt that it is nearly of the ſame nature with the common ammoniac.

NITRE has been commonly eſteemed as the moſt powerful refrigerant; and from Dr SMITH's experiments, as well as [illegible]om thoſe of Mr ALEXANDER, it appears to be ſo. But as a[illegible]efrigerants produce a determination to the ſurface of the body, and thereby increaſe the force of the circulation; ſo, after this operation, they prove directly ſtimulant to the ſtomach and alimentary canal: and in this way nitre is as remarkable as any other; and it is therefore, in large doſes, very often uneaſy and painful to the ſtomach. When it is therefore neceſſary to continue its operation as a ſudorific, it is at the ſame time neceſſary to give it in divided doſes, and at proper intervals.

I DO not doubt but the practice of Dr BROCKLESBY may be often ſuccefsful; but I could never find it convenient to imitate it, as I could hardly, or at leaſt ſeldom, find a ſtomach that would bear half the quantity of nitre that he ſeems to have employed; and in moſt caſes I have been limited in the doſes of nitre that I could exhibit. I believe that the employment of nitre, as recently diſſolved, will be a more powerful refrigerant than when the ſolution of it is entirely finiſhed; but I am of opinion that the practice has no advantages to compenſate the trouble that otherwiſe attends it.

I HAVE ſo ſeldom employed the cubic nitre that I know little of its qualities and powers.

OF the peculiar power of neutral ſalts formed of the muriatic acid, I have had occaſion already to remark, that by Dr SMITH's experiments, common ſalt compoſed of the muriatic acid and foſſil alkali is the neutral which, applied to the nerves or other irritable parts, ſhows a ſtrongly ſtimulant power, and is therefore to be thrown out of our liſt of refrigerants. Its ſtimulant power ſeems in part to be owing to the foſſil alkali in its compoſition; For this alkali, joined with the nitrous or vegetable acids, do alſo, in the firſt application to the nerves, in

Dr **Smith's** experiments, ſhow ſomewhat of a ſtimulant power, which however ſoon paſſes away, and they afterwards prove manifeſtly ſedative. Theſe neutrals, therefore, conſiſting of the fixed vegetable or volatile alkali, though formed by the muriatic acid, may be taken into our liſt of refrigerants; and their common employment as ſudorifics, for preventing the recurrence of intermittent fevers, is only to be explained upon this ground.

The uſe of the common ammoniac has been otherwiſe frequent in practice; but what are its peculiarly uſeful powers, I dare not determine. Its reſolving powers, by attenuating or diſſolving the fluids, I do not admit of; but that, like other ſaline matters, in paſſing by the excretions, they are ſuited to promote theſe, may be readily allowed.

In being joined with the Peruvian bark, as has been frequently practiſed, the ammoniac may be of ſome uſe as a diaphoretic; but I have not perceived it, and doubt if, in obviating the conſequences apprehended from the uſe of the bark, it can be of any ſervice.

The ammoniacal ſalts have been often uſed externally for the diſcuſſion of tumours; and they may poſſibly give a moderate ſtimulus to the veſſels on the ſurface; but that they enter the pores, and attenuate viſcid fluids, we muſt very much doubt of.

The neutrals compoſed of vegetable acids muſt be different according to the ſpecies of this acid employed; but they are all in general refrigerant and diaphoretic, and we know them only in that light. The one moſt frequently employed is the compoſed of the native acid and the fixed vegetable alkali, commonly known under the name of the Saline Mixture. The acid commonly employed is the juice of lemons; but that only becauſe a quantity of acid juice is moſt eaſily obtained from that fruit. I have frequently employed the expreſſed juice from ſeveral other fruits, which the country practitioner ſhould know in the caſe of the want of lemons; and I have frequently employed the juice of apples with equal advantage.

IT is hardly neceſſary that the alkaline ſalt of worm-wood, ſo frequently employed before, be now uſed, as the purer the alkali the medicine is the better.

THIS neutral ſalt, formed and given in due quantity, is, for what I can perceive, equally refrigerant and ſudorific as any other, and has this particular advantage, that it is, or can be, eaſily rendered more agreeable than any other. In my opinion it is commonly given in too ſmall doſes, and at too great intervals; and though given in large doſes, it is not ready, as nitre is, to give uneaſineſs to the ſtomach. It is often named the Antiemetic Mixture, and properly, as it is often uſeful in ſtopping vomiting, eſpecially that which ariſes in febrile diſorders, and particularly at the beginning of the paroxyſms of intermittent fevers. When given in quantity, its diuretic and purgative qualities appear as in the other neutrals.

IT has been of late a favourite practice to give the ſaline mixture during the act of effervеſcence; and beſides the advantages of introducing a quantity of aerial acid, I am perſuaded that the detachment of that acid in the ſtomach renders the whole of the mixture more refrigerant.

THE diſtilled acid of vegetables has not been employed in forming neutrals that I know of.

THE fermented acid, or vinegar joined with the fixed vegetable alkali, has certainly the powers and virtues of the ſaline mixture; but while the neutral formed of vinegar has no advantages over that formed of the native acid, the quantity of vinegar neceſſary to ſaturate the alkali gives a bulky inconvenient doſe. Whether any advantage may be gained by employing it in its concentrated ſtates, I have not tried, becauſe I doubt much if any peculiar advantage was to be obtained from them.

BOTH the native and fermented acids have been applied to the volatile alkali to form ammoniacal ſalts, and I have frequently tried this with the native acid; but I never found that the ammoniacal ſalt had any advantage over that formed of the fixed alkali.

THE application of vinegar to the volatile alkali, which gives the liquor named Spiritus Mindereri, has long been famous in the practice of this country: but if any thing is to be regarded in the quantity of the doſe employed, this in the doſes commonly given muſt be a very weak neutral; and as I have never ſeen any benefit from it, this, with the diſagreeableneſs of the empyreumatic taſte of the medicine, has made me omit it in practice altogether. I have known four ounces of it taken at once, and ſoon after four ounces more, without any ſenſible effect.

THIS, upon the notion of its being an ammoniacal ſalt, has been employed externally; but after what we have ſaid on the external uſe of the common ammoniac, it will readily appear that the weakneſs of impregnation in the ſpiritus mindereri muſt render it much leſs effectual. It is very poſſible indeed, that by employing a concentrated vegetable acid, we may obtain an ammoniacal neutral, of much more force than the ſpiritus mindereri; and if any one expects any particular benefit from ſuch a combination, he muſt endeavour to obtain it: but from what we have ſaid on the combination of the native acid with the volatile alkali, I cannot expect much benefit from any combination of the ſame alkali with the fermented acid in any of its ſtates.

AFTER the Neutral Salts, ſtrictly ſo called, I have ſet down the Sales Terreſtres, and believe that theſe may all be conſidered as refrigerants; but I cannot perceive any of them to be more powerful than the proper neutrals. Accordingly, they are little employed in practice; and if they have ever been, this in my opinion muſt have been upon ſome falſe apprehenſions both in chemiſtry and medicine.

OF the combination of acids with metallic ſubſtances, they are generally acrid and ſtimulant; and there are none of them that can be conſidered as ſedative or refrigerant excepting the Sal Plumbi or Saccharum Saturni; of which however I have ſaid enough already on the ſubject of lead, enumerated among the aſtringents.

CHAPTER VIII.

ANTISPASMODICA.

THIS is the moſt difficult ſubject that has occurred to me; and I find nothing to relieve this difficulty in any of the writers who have gone before me. All of them conſider it as an obſcure ſubject, and ſo myſterious as hardly to be attempted. This indeed is in a great meaſure juſt; but it ought to be attempted: and we hope ſome light may be thrown upon it, by conſidering the diſeaſes or morbid affections, for the cure of which the medicines named Antiſpaſmodics have been chiefly employed.

THESE in our Noſology, in the third order of the ſecond claſs of the Neuroſes, are, as fully as I could, enumerated under the title of Spaſmi: and though there is ſome difficulty of admitting that title in its moſt proper and ſtrict ſenſe, yet I could not well avoid it; and I have obviated all ambiguity by the character given of Motus Abnormes. Here alſo, though it may not be ſtrictly proper, I muſt employ the term of Spaſmodic Affections for the whole of the diſeaſes I am here to conſider.

IN the whole of theſe, the ſtate of contraction makes always the chief circumſtance; and I begin with obſerving, that in every contraction a nervous power has a part. I own that in ſome phenomena the inherent power only may be concerned; but theſe are few and inconſiderable: for even in the involuntary motions, and eſpecially when theſe are exerted in an irregular manner, it is pretty evident that there is always a concurrence of a nervous power; and in the whole of my diſcuſſions, ſuch concurrence is always to be kept in view.

On this ſubject, therefore, the firſt conſideration to be offered is, that the nervous power is always derived from the brain, or that it conſiſts in a motion beginning in the brain, and propagated from thence into the moving fibres, in which a contraction is to be produced. The power by which this motion is propagated we name the Energy of the Brain; and we therefore conſider every modification of the motions produced as modifications of that energy.

WITH reſpect to theſe, it ſeems to be a law of the œconomy, that the energy of the brain is alternately excited and collapſed, or that every contraction produced is alternated with a relaxation; and the motus abnormes, or as we name them Spaſmodic Affections, ſeem always to conſiſt in the irregularity of the alternation mentioned, as they appear in ſpaſm or convulſion.

BEFORE going further, it is proper to remark, that theſe affections take place in one ſet of functions more than in another. Thus tetanus and epilepſy affect the animal, hyſteria the natural, while palpitation and ſyncope affect almoſt only the vital functions. There is indeed in all violent caſes ſome preternatural phenomena, in which all the ſeveral functions are in ſome meaſure affected; but whoever conſiders the diſeaſes juſt now mentioned, will perceive that the affection is chiefly and eſpecially in one ſet of functions only. A concluſion to be drawn from this is, that the energy of the brain is exerted differently, and often ſeparately, with reſpect to the ſeveral functions, diſtinguiſhed by phyſiologiſts into animal, natural, and vital. This is a ſtate of the œconomy which has been little attended to, but is very manifeſt in the buſineſs of ſleep and watching, and in the diſeaſes above mentioned. See *Firſt Lines*, from MCCLXII to MCCLXV.

It is now further to be remarked with reſpect to the whole, that though the phenomena appear in particular parts, that is in the organs concerned in the exerciſe of the ſeveral functions, the whole of them muſt depend upon an affection and peculiar ſtate of the energy of the brain. It is poſſible indeed, that certain motions may take place in particular parts, independent of any change in the ſtate of the brain; but the inſtances of theſe are few and inconſiderable, and probably they cannot ſubſiſt without the brain's being brought into that ſtate that might have induced them.

But however all this may be, it is confidently preſumed that ſpaſmodic affections are often primarily, and always chiefly, affections of the brain. This may clearly enough appear from what has been ſaid in general eſtabliſhing all motions as neceſſarily depending upon the energy of the brain; but as the propoſition is of conſequence, it may be proper to add ſome more particular proofs of it here.

One is, that ſpaſmodic affections often ariſe from applications to particular parts of the body; but for the moſt part, the effects produced in other parts cannot be accounted for, but by ſuppoſing the intervention of the brain. Such is the caſe of odours and ſome other impreſſions, whoſe producing ſpaſmodic affections cannot be explained otherwiſe, or by any conſent of nerves.

The intervention of the brain is more eſpecially proved by this, that in many caſes, the effects of applications can be prevented by interrupting the communication of the parts affected with the brain, by cutting through or compreſſing the nerves which form that communication.

But farther, that the ſtate of the brain has a very ſpecial concern in ſpaſmodic affections, the ſtrongeſt and cleareſt proof is this, that all theſe affections, and all the different modes of them, can be produced by paſſions of the mind; which we maintain to be cauſes operating always firſt, and chiefly in the brain.

Having thus eſtabliſhed, that ſpaſmodic affections depend very entirely upon the ſtate of the energy of the brain, we proceed to conſider what that ſtate may be in different caſes; and we judge of them, in the firſt place, as they produce Spaſm, ſtrictly ſo called, or convulſion: and though our total ignorance of the mechaniſm that takes place here, will not allow us to go far in explaining it, we ſhall make ſome obſervations, which we hope may be uſeful.

In ſpaſm there appears to be a preternatural force exerted in the energy of the brain, as appears both in the degree and duration of the contraction produced; but with a view to the general law above mentioned, it is proper to remark, that even here ſome alternate contraction and relaxation takes place, as I have pointed out in the *Firſt Lines*, MCCLXI.

In convulſion, which always conſiſts in manifeſtly alternate contraction and relaxation, it appears, that from other cauſes than the will, the contractions are performed with more force and velocity than uſual; but at the ſame time, as they are ſtill ſuch as admit of an alternate relaxation, the diſeaſe conſiſts in an alternation's being produced more quickly than is natural. This hurried alternation we ſuppoſe to depend upon a certain ſtate in the general energy of the brain, which may be determined by cauſes to be mentioned hereafter, to affect one ſet of functions more than another, and to produce there the ſpaſmodic affections which theſe functions are liable to.

This perhaps may not appear very clear, and may be conſidered as hypothetical; but we ſuppoſe it may be illuſtrated by ſome further conſiderations. The alternation of contraction and relaxation in the animal functions is commonly regulated by the will, and therefore ſeems to admit ſome difference in the quickneſs of the alternation and repetition; but it is probable that that difference has its limits ſet to it by the animal œconomy, or at leaſt by habit; ſo that if at any time it is hurried beyond the uſual meaſure, ſome confuſion and diſorder is occaſioned with the effect on the general energy mentioned above.

This ſeems well illuſtrated by ſurpriſe, or impreſſions unforeſeen and unexpected, breaking in upon the order and velocity of the train of ideas then going on in the mind; and this we know will frequently bring on every form of ſpaſmodic affection. Our doctrine ſeems alſo to be farther illuſtrated by the caſe of ſtammering; when a diffidence and heſitation interrupting or hurrying the ſucceſſion of ſyllables or words, throws the face, and ſometimes the whole body, into convulſions; which may always be avoided, by giving a meaſure regulating the velocity in the ſucceſſion propoſed, as is done by the perſons attempting it in the manner of a ſong.

From the whole that has been juſt [illegible] ſaid, we think it will appear, that convulſions may be brought on by whatever hurries the velocity of the alternations which take place in the energy of the brain.

It will illuſtrate the whole to obſerve, that as ſpaſmodic affections thus depend upon a change in the manner and order of the motions taking place in the brain, they will occur more or leſs readily as that manner and order is more or leſs readily changed, which happens to be different in different perſons. That this diſpoſition to admit more or leſs readily of a change in the ſtate, and whole of the motions depending upon the brain, is different in different perſons, has been often taken notice of; and it has been as univerſally obſerved, that in perſons of very great mobility in this reſpect, ſpaſmodic affections are moſt readily excited, and do moſt frequently ariſe; which ſeems to confirm very much the doctrine we have delivered.

To complete our pathology as well as we can, we are next to conſider what it is that determines ſpaſmodic affections to affect one ſet of functions more than another. It may, in the firſt place, be a mobility in the energy of the brain, greater with reſpect to one ſet of functions than to another; and therefore it is that the paſſions of the mind, which may produce any of the ſpaſmodic affections, do however produce them in one ſet of functions rather than in another.

It is poſſible, therefore, that the affections produced may depend entirely upon the ſtate of the brain; but it ſeems alſo probable, that the affections produced often depend upon a conformation and ſtate of the organs concerned in the functions to be affected, determining the energy of the brain to be directed to thoſe parts. Thus certain organical affections of the heart itſelf, or great veſſels [illegible]ted with it, are found to give occaſion to the ſpaſmo[illegible]ctions of palpitation and ſyncope.

It is probable that a certain ſtate of the lungs gives occaſion to aſthma; as we can ſo often obſerve, that applications made to the lungs themſelves, and not to the brain, bring on the diſeaſe.

It is equally probable that a certain ſtate of the alimentary canal, induced by a ſtate of the ovaria, determines to the production of hyſteria.

It is not eaſy to determine what particular ſtate of the organs of voluntary motion ſhould give occaſion to the ſpaſmodic affections of theſe; but it is probable, that as the energy of the brain is chiefly exerciſed in theſe motions, and with ſuch a variety that we may ſuppoſe them to acquire a conſiderable mobility, which, joined with the conſtitutional condition of the ſame, may diſpoſe them to be affected by any conſiderable change of the manner and order of the motions of the brain, and therefore to produce epilepſy, or the chief ſpaſmodic affection of the animal functions: And that any general affection of the energy of the brain is ready to produce this, we conclude from its being one of the moſt frequent of ſpaſmodic affections, and certainly more frequent than thoſe of ſyncope, aſthma, or hyſteria.

The ſcope and purpoſe of all that we have now ſaid, is to eſtabliſh this general propoſition, That ſpaſmodic affections, whether they ariſe primarily in the brain, or in particular parts, do conſiſt chiefly, and always in part, in an affection and particular ſtate of the energy of the brain; and the operation of antiſpaſmodic medicines muſt conſiſt in their correcting this morbid or preternatural ſtate in the energy of the brain, by their correcting either the ſtate of preternatural excitement or collapſe, or by obviating the too ſudden alternation of theſe ſtates.

Before, however, proceeding to a more particular conſideration of theſe indications, and of the remedies ſuited to them, which are ſtrictly to be named Antiſpaſmodics, I muſt obſerve, that there are remedies, though not ſtrictly ſuch, which are however ſuited to cure ſpaſmodic affections, and therefore may occaſion ſome confuſion in the uſe of terms.

The firſt of theſe I would take notice of are the remedies ſuited to obviate the prediſponent cauſe of ſpaſmodic affections. We have ſaid above, that a certain mobility of the whole ſyſtem gives ſtrongly this prediſpoſition, and therefore, that tonics may be fitted to obviate this; and when the diſeaſe depends upon mobility alone, theſe may be entirely the remedies of it: but we have ſeldom found them to prove truly ſuch, both becauſe it is difficult to render the operation of tonics ſufficiently durable, or becauſe, when either the diſeaſe depends upon the ſtate of particular parts which tonics do not change, or when it depends upon a plethoric ſtate of the ſyſtem which tonics have rather a tendency to aggravate, tonics cannot be the proper remedies. The laſt circumſtance happens often to take place in the caſes of hyſteria and epilepſy.

Another means of obviating ſpaſmodic affections, is by avoiding the exciting cauſes. We have ſaid above, as well as in our Firſt Lines of the Practice of Phyſic, that an occaſional turgeſcence in the blood-veſſels of the brain is one of the moſt frequent cauſes exciting epilepſy, and perhaps ſome other ſpaſmodic affections; but it will be obvious, that ſuch exciting cauſe muſt be avoided by employing refrigerants, which cannot be conſidered as antiſpaſmodics.

A THIRD caſe in which the proper antiſpaſmodics may be often ſuperfluous and uſeleſs, perhaps hurtful, is, when the diſeaſe does not primarily depend upon a ſtate of the brain, but ariſes from a peculiar conſtitution of certain parts, which is communicated to the brain. In ſuch caſes it will be evident, that the affection of the brain cannot be corrected till the primary diſeaſe is cured; and inſtances of this kind I have given above, as occurring with reſpect to particular functions.

HERE I ſhall remark only with regard to one of thoſe inſtances, as it is the beſt illuſtration of the general doctrine, and will give me an opportunity of making a particular remark with reſpect to it.

THE inſtance I ſpeak of is in the caſe of palpitation, ſyncope, and of other irregular motions of the heart. Every practitioner knows, that theſe diſorders commonly depend upon an organic affection of the heart, or of the great veſſels immediately connected with it, as aneuriſm, polypus, or oſſifications, which are commonly conſidered as incurable diſeaſes. Diſſections have indeed ſo commonly diſcovered ſuch cauſes, that practitioners are very ready to deſpair of curing ſuch diſeaſes, and deſert all attempts towards it; but I think it may be for the inſtruction of practitioners to give the following caſe:—

A GENTLEMAN pretty well advanced in life was frequently attacked with palpitations of his heart, which by degrees increaſed both in frequency and violence, and thus continued for two or three years. As the patient was a man of the profeſſion, he was viſited by many phyſicians; who were very unanimouſly of opinion, that the diſeaſe depended upon an organic affection of the heart, as we have juſt now ſaid, and conſidered it as abſolutely incurable. The diſeaſe, however, after ſome years, gradually abated, both in its frequency and violence, and at length ceaſed altogether; and ſince that time, for the ſpace of ſeven or eight years, the gentleman has remained in perfect health, without the ſlighteſt ſymptom of his former complaint.

BESIDES this, I have had ſome other inſtances of palpitation, both violent and laſting, for ſome length of time; and theſe eſpecially, with the inſtance above mentioned, perſuade me that ſpaſmodic affections, though ſometimes both violent and durable, are not however always depending upon organic and incurable affections of particular parts, but may very often depend entirely on an affection of the brain alone.

HAVING now mentioned ſeveral remedies which cannot be ſtrictly conſidered as antiſpaſmodics, and having mentioned, though with leſs accuracy, the caſes in which the proper antiſpaſmodics may be uſeleſs or ſuperfluous; I proceed to conſider thoſe which are more ſtrictly intitled to the appellation.

I CONSIDER them as to be referred to two heads; the one of Sedatives, and the other of what I would ſtill more ſtrictly name Antiſpaſmodics, and which I would judge to be of a quality and operation different from thoſe others.

WITH reſpect to the firſt, it may ſeem ſurpriſing that opium ſhould not have entered into my catalogue of antiſpaſmodics, whilſt every practitioner conſiders it as the chief remedy in the moſt part of ſpaſmodic affections. Their opinion is certainly juſt and true; but the conſideration of its operation being often different from that of the proper antiſpaſmodics, I overlooked the matter in compoſing my catalogue.

BUT it is now incumbent on me to obſerve, that as ſpaſmodic affections are ſo often begun by an increaſed excitement of the energy of the brain; ſo, opium being the moſt powerful means of diminiſhing this excitement, it muſt very often be the moſt certain and ready means of both obviating and curing ſpaſmodic affections; but at the ſame time we muſt remark, that it often fails to anſwer either purpoſe. If the increaſed excitement ariſes from an irritation applied to a particular part of the body, to the removal of which opium cannot contribute, the diſeaſe may continue to recur, although the largeſt doſes of opium have been employed. Thus it happens in tetanus, from wounds whoſe communications with the brain cannot be intercepted, that opium often fails to prove a cure.

ANOTHER caſe in which opium may fail, is where the excitement of the brain ariſes from a plethoric ſtate of the ſanguiferous ſyſtem, and upon an occaſional turgeſcence in the bloodveſſels of the brain. In theſe caſes, opium is ſo far from proving a remedy, that it often is a means of aggravating the diſeaſe; and this will explain why it ſo often fails and does harm in caſes of epilepſy and hyſteria.

IT is hardly neceſſary to obſerve here; but as the excitement and collapſe of the brain do mutually produce one another, ſo the ſpaſmodic affections do always conſiſt in ſome increaſed excitement, yet this may be begun by a ſtate of collapſe; and therefore that ſtimulants, ſuch as the volatile alkaline ſalts, or certain highly odoriferous ſubſtances of a grateful kind, may obviate the coming on of ſpaſmodic affections.

THE other ſet of antiſpaſmodics, and which I hold to be properly and ſtrictly ſuch, appear to me to be of two kinds; one of them conſiſting of a ſet of ſubſtances of a diſagreeable odour, and therefore commonly named Fœtids, both from vegetable and animal ſubſtances. The operation of theſe I take to be in this way; that as all diſagreeable ſenſations are ſedative, or means of weakening the energy of the brain, ſo I conceive that our fœtid medicines, by obviating or moderating the increaſed excitement which begins ſpaſmodic affections, may be the remedies of theſe.

THE other kind of antiſpaſmodics appear to me to conſiſt of a highly volatile oil, and which, by its volatility, acquires a ſingular power with regard to the nervous fluid of animals. Theſe have manifeſtly the power of obviating or moderating that excitement which begins ſpaſmodic affections, and are thereby the remedies of ſuch. But I conceive them to have alſo another power, which, though I cannot explain, ſeems to be manifeſtly that of giving a tone and ſteadineſs to the energy of the brain, ſo as to prevent thoſe ſudden alternations of excitement and collapſe in which ſo many convulſive diſorders conſiſt. This may not be quite clear to my readers, and I offer it as a conjecture only to be farther examined by ſpeculative phyſicians. Whilſt the nature of the nervous power and its ſeveral motions are ſtill ſo imperfectly known, it ſeems to be allowable, with a proper reſerve in the application, to enter into ſome ſpeculations and conjectures.

PARTICULAR ANTISPASMODICS.

AMBRA-GRISEA.

THIS is a medicine ſo little employed in our practice, that it is omitted in the liſt of both colleges; but it ſtill retains a place in all the foreign diſpenſatories, and by its ſtrong odour it promiſes to be an active medicine. I am however ſo little acquainted with it, that I muſt refer entirely for information on this ſubject to Dr LEWIS, who has given its natural and chemical hiſtory, as likewiſe the various formulæ in which it has been employed as a medicine.

SUCCINUM.

THIS, in its entire ſtate, has been often employed as a medicine; but as it diſcovers, in that ſtate, no active parts, and is entirely inſoluble in our fluids, it muſt be, as it has always appeared to me to be, an abſolutely inert ſubſtance: and though ſtill perhaps employed by midwives and empirical practitioners, I believe it to be now entirely neglected by Britiſh phyſicians.

MUCH pains has been taken to obtain tinctures containing the more active parts of amber; but I have never found that any impregnations of theſe tinctures were conſiderable enough to give an active and uſeful medicine, and the attempt has been entirely deſerted in Britain. The authors of the Pharmacopœia Genevenſis have made an imperfect attempt in employing a large proportion of rectified ſpirit of wine; and the Daniſh and Swediſh Diſpenſatories have done ſomewhat better in employing the liquor anodynus mineralis, or the ſpiritus æthereus vitriolatus: and by theſe menſtruums indeed ſome ſolution and extractions is made of the amber; but in theſe ſolutions I could never diſcover any virtues but what might be imputed to the ætherial ſpirits.

THE only active powers that can be obtained from amber are to be found in its diſtilled oil and ſa[illegible] The latter we have very ſeldom genuine, and therefore I cannot poſitively determine its virtues; but when genuine and well purified they do not promiſe to be powerful, as I believe they differ little from vegetable acids: and the liquor cornu cervi ſuccinatus ſo much ſpoken of by foreign writers, I have never found to be of any efficacy, or a better medicine, than the ſpirit of hartſhorn rendered neutral by any vegetable acid.

THE diſtilled oil of amber is a more powerful medicine, but not in the ſtate in which it is obtained by a firſt diſtillation; and now accordingly, in all the diſpenſatories it is ordered to be rectified by after diſtillations. This rectification, however, is variouſly ordered. The London college have ordered the diſtillation of it to be repeated three times; but unleſs they had ordered, that in every diſtillation a leſs and leſs proportion of the whole was to be drawn off, the operation may be inaccurate and very imperfect. The Edinburgh and Swediſh diſpenſatories have done better, in ordering the rectification to be made by the addition of water in the proportion of ſix parts of water to one of oil; and the Edinburgh college have at the ſame time judiciouſly ordered that two thirds of the water only ſhould be drawn off at each diſtillation. This indeed will give a great improvement to the oil; but I have hardly thought it enough to give it the greateſt poſſible purity it is capable of. I have employed ſeveral diſtillations with water, and have always found, that by repeated diſtillation

ſtillation the oil became of more fluidity and volatility, acquired a more agreeable odour, and proved a more powerful medicine.

It is here to be particularly obſerved, that all very volatile oils become medicines which have been conſtantly reputed to be powerful antiſpaſmodics; and however their operation may be explained, I put the rectified oil of amber into this ſet of medicines, which I have found, in many caſes of epilepſy, hyſteria, and other ſpaſmodic affections, to be uſeful. The oil of amber may be given in doſes from ten to thirty drops.

It is only when amenorrhœa can be conſidered as part of a ſpaſmodic affection that the œleum ſuccini ſhows any emmenagogue powers.

PETROLEUM.

Under this title I mean to comprehend all the foſſil oils that are found in the earth; and I believe I might comprehend, in the ſame claſs, the whole of the bituminous foſſils, as the aſphaltum or bitumen judaicum, and pit-coal.

I believe it to be agreed among both naturaliſts and chemiſts, that the inflammable part of all theſe foſſils is that fluid, volatile, and very inflammable oil that is named Naphtha, which is found in its ſeparate ſtate in ſome places of the earth, or upon the ſurface of waters into which it has been waſhed out from their ſides or bottoms. The production of it is not accounted for; but it is pretty certainly a foſſil matter that is generated in the earth; and by the admixture of various matters it muſt meet with there, it puts on various forms, from that of a finer oil to a groſſer, and through all the different degrees of a groſſer and thicker, till it becomes quite of a ſolid conſiſtence.

IT is not neceſſary for me to proſecute the natural or chemical hiſtory of theſe ſubſtances here, ſince it is enough for the purpoſe of medicine for me to obſerve, that while they are in a ſeparate, and in any degree in an oily or liquid ſtate, the oil retains an acrimony that renders it ſtimulant, and ſo much antiſpaſmodic, as to have been uſeful in ſeveral ſpaſmodic affections. How far the petroleum is improved as a medicine, by having diſſolved a portion of flowers of ſulphur, I have not had experience enough to determine. The petroleum, in many of its different ſtates, may be a medicine as I have ſaid; but it is always, in every form in which it can be exhibited, a very diſagreeable remedy, and I have never found its powers to be ſo conſiderable as to compenſate that inconveniency. The only uſe of the whole bituminous foſſils that I can find worth attending to, is this, that in diſtillation they afford a volatile oil of the nature of that of amber; and which, by the rectification propoſed for that, may be brought to the ſame degree of purity and virtue, and perhaps, in ſome caſes, at a leſs expence.

FROM VEGETABLES.

FETID PLANTS.

ARTEMISIA.

THIS, as a fetid and antiſpaſmodic, ſeems to be the weakeſt of the whole ſet, and juſtly omitted in the London liſt; and, though retained in the Edinburgh, is not known in our practice.

THIS plant has led the learned Profeſſor MURRAY to give us a valuable compilation on the ſubject of Moxa; but this does not ſeem to me to belong to this place, as it ſeems to be a general and not a particular remedy.

THE other plant of the claſs of Syngeneſia which has entered my liſt, is the

MATRICARIA.

THIS is a plant of more active parts than the former, and may deſerve to be more employed than it has been; but it is not retained in either catalogue of the Britiſh colleges, and I have ſeldom had ſuch opportunity of ſeeing it employed as to enable me to determine preciſely concerning its virtues.

CUMINUM.

THE general virtues of this as a carminative and antiſpaſmodic I have given already; but a ſomewhat more diſagreeable odour attending this than the other carminative ſeeds, has led me to inſert it again here; and I eſteem it to be the moſt antiſpaſmodic of the whole ſet.

I HAVE, in my liſt of fetids, inſerted the pulegium, but very improperly; and I have ſaid enough to explain my opinion of its powers when I treated of it as one of the verticillated plants.

ATRIPLEX FOETIDA.

WHAT genus this properly belongs to I have pointed out in my catalogue.

IT is a plant of a remarkable fetor, and may be preſumed, from that, to be a powerful antiſpaſmodic. Although it is not admitted into the liſt of the London college, it has been frequently employed in this country with advantage; not however ſo frequently as might be expected, as it is a plant, in its freſh ſtate, not always ready at hand, and in its dry ſtate it loſes all its ſenſible qualities. It can only be employed therefore in its recent ſtate, and the moſt convenient formula is that of a conſerve; and as it is not always eaſy to reconcile our patients to it even in that ſtate, it is not employed ſo often as I would wiſh.

RUTA.

THE firſt thing to be obſerved with reſpect to this plant, is, that the herb and ſeeds give out eſſential oils in different quantities, and, as I judge, of different qualities; but as it is not marked in what different ſtate of the plant the diſtillations or extractions have been made, this has produced, in my opinion, the different reports that have been given of the products obtained from this plant, and has alſo occaſioned ſome different reports of its virtues. The analyſis therefore is to be ſubmitted to a more accurate examination; but, in the mean time, from its ſenſible qualities, and my experience of its uſe, I have no doubt in aſſerting its antiſpaſmodic powers, as employed in its diſtilled water, in its conſerve, or in its extract. The diſtilled water is to be taken from the plant before it has put forth its flowers, and may be much improved by a cohobation. The conſerve, if made as formerly propoſed, with three parts of ſugar, is a weak and inconvenient formula; but if prepared with an equal part of ſugar only, and made in ſmall quantities, ſo that the plant may be ſtill taken in its recent ſtate, it is an uſeful antiſpaſmodic. The extract is certainly an uſeful medicine, and has the approbation of both our colleges. It is poſſible that it may exert ſome emmenagogue virtues, though I have not been ſo ſucceſsful in employing them as I could wiſh.

SOME other virtues aſcribed to Rue I judge to be in common to many other plants, and therefore take no farther notice of them here. One virtue particularly aſcribed to it, that of reſiſting contagion, or of expelling it when taken in, I hold to be abſolutely without foundation; and I hope the reaſons for this opinion have been, upon ſeveral occaſions, already explained.

SABINA.

THIS is a plant which, of all others, gives out the greateſt proportion of eſſential oil; and as this oil retains the peculiar odour and taſte of the plant, the medicinal virtues of the whole plant may be fairly aſcribed to it; but it is a very acrid and heating ſubſtance, and I have been often, upon account of theſe qualities, prevented from employing it in the quantity perhaps neceſſary to render it emmenagogue. I muſt own, however, that it ſhows a more powerful determination to the uterus than any other plant I have employed; but I have been frequently diſappointed in this, and its heating qualities always require a great deal of caution.

OF its anthelmintic qualities, or of its powers in healing carious bones, or foul ulcers, I have had no experience.

GUMMI FETIDA.

ASAFOETIDA.

I HAVE put this at the head of the liſt as the moſt powerful of the whole, and when it is in a tolerably recent and genuine ſtate, it is a moſt valuable medicine. This depends upon the force of its odour, and upon that odour's being of a very diffuſible kind, and which I believe therefore penetrates the nerves more readily than any other vegetable odour. All this explains its being a powerful and ſuddenly operating antiſpaſmodic. Accordingly I have found it to be the moſt powerful in all hyſteric caſes; and when the preſence of an hyſteric paroxyſm prevented medicines being taken by the mouth, I have found it, given in glyſter, to be very effectual. When taken into the ſtomach it is particularly uſeful in relieving thoſe ſpaſmodic complaints which ſo frequently attend dyſpepſia; and as it has manifeſtly a laxative power, it is well ſuited to relieve the flatulent colics of hyſteric and hypochondriac perſons.

IT is in ſome meaſure ſuited to relieve the ſpaſmodic aſthma; but as the ſpaſm in theſe caſes is of an obſtinate kind, I have ſeldom found the aſafœtida of much ſervice in aſthmatic paroxyſms.

As all the fetid gums ſeem to be determined to the lungs, and to promote expectoration; ſo I have found the aſafœtida the moſt powerful for this purpoſe, and more powerful than the ammoniac ſo frequently employed.

THE aſafœtida has been at all times conſidered as an anthelmintic, and I have no doubt of its being ſuch; but I have ſeldom found it effectual; which, however, I impute to our not having it in ſo recent and diffuſible a ſtate as were to be wiſhed.

THE fetid gums have always been commended as emmenagogues; and certainly the aſafœtida ſhould have the beſt pretenſions to this power; but whether it be owing to the imperfect ſtate in which we too frequently have this medicine, or to ſomewhat in the nature of the amenorrhœa, I would not poſitively determine: but this is certain, that I have very ſeldom ſucceeded in employing the aſafœtida as an emmenagogue.

THE aſafœtida is employed in various forms, as it may be given in its ſolid form, or may be extracted by either watery or ſpirituous menſtruums, and eſpecially as its virtues riſe in diſtillation with thoſe of the latter kind.

IN a ſolid form it ſeldom acts as a powerful antiſpaſmodic; and therefore, excepting where it is to be joined with aloes or other medicines, I ſeldom employ it in this ſtate.

WHEN it is to be employed as an antiſpaſmodic, and eſpecially where a ſudden operation is required, the form of tincture or volatile ſpirit are the moſt proper. As the frequent repetition of the ſame antiſpaſmodic is ready to weaken its powers, ſo ſome variety of formulæ, and of combination with other antiſpaſmodics, may be neceſſary. Of the tinctures, I take the tinctura fuliginis to be the leaſt uſeful; and in my opinion it is properly omitted by the London College.

FOR the purpoſes juſt now mentioned, I hold the ſpiritus volatilis fœtidus of the Edinburgh College, or the ſpiritus ammoniæ fœtidus of the London, when they can be conveniently given in large doſes, to be the moſt powerful formulæ; but much of all this muſt be left to the diſcretion of practitioners.

AMMONIACUM.

OF all theſe enumerated among the fetid gums, the ammoniac has the leaſt of the fetid odour; and therefore I conſider its antiſpaſmodic powers as the leaſt conſiderable. It is, however, an acrid and heating ſubſtance, which, determined to the lungs, may prove an expectorant; which is the virtue commonly aſcribed to it: but I have ſeldom found its power very remarkable; and in common practice I have frequently found the miſchief ariſing from its heating qualities greater than the benefit obtained by its expectorant powers.

THE ammoniacum has been commonly commended for its power, externally applied, in reſolving indurated tumours; but the theory of this is very doubtful, and I have not any clear proof from experience of its having any ſuch power.

GALBANUM.

THIS is indeed a fetid gum, and ſhould have the virtues of ſuch; but it is neither of a ſtrong odour nor of diffuſible quality, and therefore its virtues are not conſiderable. By itſelf it is of little power, but is properly retained in practice, as affording the variety ſo requiſite in the uſe of antiſpaſmodics. The London College in my opinion have properly given a gum pill without the aſafœtida, which is ſo often diſagreeable to particular perſons. Though the Edinburgh College have perhaps given a more effectual medicine, they have miſſed the advantage of the variety mentioned.

THE galbanum has been commended for favouring the ſuppuration of inflammatory tumours; but its powers in this way have never appeared to be conſiderable: and our ſurgeons have found that they can execute this buſineſs more certainly and ſpeedily by the frequent repetition of emollient poultices.

OPOPANAX.

THIS is the leaſt diſagreeable of the fetid gums, and therefore of the leaſt virtue. In its ſeparate ſtate it is little employed; and properly, as its particular virtues are not aſcertained. It is however properly retained in practice, as it affords the variety juſt now mentioned.

SAGAPENUM.

THIS is the moſt active and powerful of the three laſt mentioned gums, and has a ſtronger and more diffuſible odour than any of them: It has therefore a better title to be retained in practice, and comes the neareſt to the powers of the aſafœtida; but it is not ſo ſuddenly operative, and is hardly to be otherwiſe employed than as affording a variety.

WITH regard to the laſt mentioned gums, I have not taken notice of the various means of extracting them, as they cannot be much improved in their activity by their being treated either by tincture or diſtillation.

TACAMAHACA.

THE common tacamahaca of our ſhops ſhould not have had a place here, not being employed as an internal medicine; and as an external I cannot perceive its virtues. There is however a medicine under the title of *Tacamahaca in Shells*, which from the accounts of materia medica writers, ſeems to have more active power. It was therefore allowable to point it out to ſtudents of materia medica as an object of enquiry; but it is yet ſo little in uſe, that I myſelf have had no opportunities of being acquainted with it.

RADICES GRAVEOLENTES.

Pæonia.

This was very anciently, and has been always ſince, an article of the materia medica. In our Hiſtory we had occaſion to give a ſtricture on the ſubject with regard to Galen, which does neither credit to him nor to the virtue of the medicine. Since that time, its fate and reputation have been various; while ſome commend its virtues, and others declare their diſappointment in employing it.

Its ſenſible qualities, in its recent ſtate, promiſe ſome virtues; but theſe qualities are very inconſiderable, and at the ſame time very tranſitory; ſo that in the powdered root, the form in which it is moſt frequently employed, I can hardly perceive them to be any at all. In the frequent employment of them, I could never perceive any effect, either in epilepſy or other ſpaſmodic affections. To conclude the ſubject, it is enough to obſerve, that both the Edinburgh and London Colleges have now omitted it in their liſts of the materia medica.

Valeriana Sylvestris.

This is a root of more virtue and deſerved reputation. It has been almoſt at all times in eſteem, but particularly ſince the time of Fabius Columna. It has been ſince much taken notice of and employed in practice, frequently with ſucceſs, but frequently alſo, particularly in my own practice, without any effect at all. The latter circumſtance, however, I impute to this, that the beſt remedies may often fail in a diſeaſe which depends upon a diverſity of cauſes; and partly to this, that the valerian is frequently employed in an improper condition. In the condition we have it, in different ſhops and at different times, I have found the ſenſible qualities of it to be very different; and I am perſuaded, that unleſs it is taken up at a proper ſeaſon, and properly preſerved, it is often a very inert ſubſtance.

I do not conclude from its ſingular power with reſpect to cats, that it muſt have peculiar powers with reſpect to the animal œconomy; but I conſider its more or leſs activity with reſpect to cats, which is different at different times, to be a teſt of its active powers in general.

Its antiſpaſmodic powers in general are very well eſtabliſhed; and I truſt to many of the reports that have been given of its efficacy; and if it has ſometimes failed, I have juſt now accounted for it, adding only this, that it ſeems to me, in almoſt all caſes, that it ſhould be given in larger doſes than is commonly done. On this footing, I have frequently found it uſeful in epileptic, hyſteric, and other ſpaſmodic affections. It ſeems to be moſt uſeful when given in ſubſtance; and in large doſes I have never found much benefit from the infuſion in water.

The London college have attempted a tincture ſtrongly impregnated; and I have attempted one ſtill ſtronger, by taking the root in double the quantity, and ſtraining the tincture by a ſtrong expreſſion: and this I have found, in perſons who cannot bear a large doſe of the menſtruum, is a powerful remedy, and ſuddenly operating. The volatile tincture preſcribed by both colleges, is often, as ſuddenly operating, an effectual remedy, and gives an excellent variety of antiſpaſmodic formulæ; but whatever may be the efficacy of the valerian, the menſtruum here has certainly a ſhare in it.

I readily believe in the anthelmintic power of the valerian, but have hardly had an opportunity of perceiving its effects.

FULIGO

Fuligo Ligni.

If this had not been retained in the liſt of the Edinburgh college, I ſhould not have given it a place here; and I judge it to be very properly omitted in that of the London. It is a heterogeneous maſs that has not yet been with any accuracy analyſed, at leaſt ſo as to aſcertain its proper application in medicine; and this is eſpecially uncertain, as on different occaſions it is of different kinds.

It has been retained in the Edinburgh diſpenſatory merely, if I miſtake not, by the habit that Scottiſh practitioners have been in of preſcribing the tinctura fuliginis as a variety of the antiſpaſmodic formulæ; but it is now much neglected by them: and although we cannot deny that the ſoot may contribute ſomewhat to the intention of the medicine, yet the tincture has never ſhown to me any power that might not be aſcribed very entirely to the aſafœtida it contains.

Olea Essentialia.

Although theſe, for the moſt part, have been treated of before under the title of Stimulantia, I could not miſs to give them a place here, becauſe, as I obſerved above, they often exert an antiſpaſmodic power. Their effects in this way are commonly moſt remarkable in the alimentary canal, and eſpecially where the ſpaſm may be ſuppoſed to ariſe from ſome loſs of tone in ſome portion of the muſcular fibres, and when therefore a ſtimulus, exciting a motion in the other parts of the canal may be the effectual remedy.

The antiſpaſmodic power of eſſential oils is very much confined to theſe parts, and, excepting in a very few particulars, do not ſhow their power with reſpect to the whole ſyſtem; or, if they do, it is probably only where the more general or particular affections depend upon a ſtate of the ſtomach which may be corrected by the operation of antiſpaſmodics applied to it.

IT is very generally the effect of eſſential oils to be ſtimulating and heating to the ſyſtem; and therefore, when any degree of phlogiſtic diatheſis prevails in the ſyſtem, the uſe of theſe eſſential oils is to be avoided. Even in ſome caſes of ſpaſmodic affections of the alimentary canal, though ſome ſuſpicion of phlogiſtic diatheſis remain, the antiſpaſmodic power of eſſential oils may ſeem to be neceſſary; but in ſuch caſes it is at leaſt deſireable to employ the eſſential oils of the leaſt inflammatory kind. To this purpoſe, I am of opinion that the leaſt inflammatory are thoſe of the umbelliferous ſeeds; that next to theſe are the oils of the verticillated plants; and that the moſt inflammatory of all are thoſe of the aromatics ſtrictly ſo called. But all this I leave to be farther examined, and more accurately determined, as the various qualities of the eſſential oils have not yet been examined with ſo much nicety as ſeems to be proper; and to this purpoſe a particular obſervation here occurs to me.

CAMPHIRE is in many reſpects to be conſidered as an eſſential oil; but its operation upon the human body ſeems to be very different from that of moſt others. It is a powerful antiſpaſmodic with reſpect to the whole ſyſtem, without being readily heating to it, as I think I have demonſtrated above: and I repeat the obſervation here for the ſake of remarking, that ſeveral of the eſſential oils approach to the nature of camphire, and contain manifeſtly a portion of it in their compoſition. It may be therefore ſuppoſed, that ſuch camphorated oils may be more powerfully antiſpaſmodic, and at the ſame time leſs heating. Such I take to be the caſe with the peppermint; but whether there are any others containing ſo large a proportion of camphire as to give them the ſame qualities with this, and different from the moſt part of the other eſſential oils, I have not been able to determine.

Æther.

This is entirely an artificial ſubſtance, formed by a combination of alcohol with a concentrated acid. For a long time we were acquainted with it as formed with the vitriolic acid only; but we have ſince learned, that not only the other foſſil acids of nitre and ſea-ſalt, but that alſo the vegetable acid, may be managed ſo as to form an æther, or an oil of great volatility. Although we are only very well acquainted with the vitriolic æther, all of theſe formed of the other acids ſeem to be endued with the ſame antiſpaſmodic power; and how far this is anywiſe different in the different ſpecies, is not yet properly aſcertained. They are employed in all ſpaſmodic affections, whether of the whole ſyſtem or of the alimentary canal; and the ſuddenneſs with which they are diffuſed gives them great advantages. They are irritating and heating to the parts to which they are immediately applied, in which they reſemble camphire; but reſemble this alſo in not being heating to the whole ſyſtem. They reſemble that alſo in another reſpect, in being antiſpaſmodic in the caſe of inflammatory ſpaſm; and thus, by an application commonly known, they cure headach, toothach, and ſome rheumatic affections. Æther ſeems alſo to be endowed with ſome anodyne virtue; and this, aſcribed to the liquor anodynus mineralis Hoffmanni; or what I take to be the ſame thing, the ſpiritus vitrioli dulcis, ſeems to me to be tolerably well founded.

THE only other obſervation I have to make with reſpect to æther, is, that the vitriolic moſt commonly employed is ready to have ſome portion of the ſulphureous acid adhering to it; and that, in proportion to ſuch adherence, the virtues of it are greatly impaired. To obtain, therefore, a powerful medicine, it is neceſſary that great pains be taken to render the æther free from all adherence of the ſulphureous acid.

OLEA EMPYREUMATICA.

THE empyreumatic oil moſt noted for its antiſpaſmodic virtues is very conſtantly taken from the empyreumatic oil of animals; and it is therefore, in its rectified ſtate, named the Oleum Animale. I think it however proper to inform my chemical reader, that an oil of the ſame volatility and antiſpaſmodic power, as I know from my own experience, may be obtained from the empyreumatic oil of vegetables, when treated in the ſame manner as propoſed for that of animals; and it is therefore that, in my catalogue, I choſe to give the general title of Empyreumatic.

I DO not however allege, that any particular advantage is to be got by working upon the vegetable oil; and therefore I go on to ſpeak of this ſubject as it is commonly obtained from animal oils.

THE preparation of this oil was formerly, and as particularly delivered by Dr HOFFMAN, a very troubleſome work; but ſucceeding chemiſts have found, that the purpoſe of the whole may be obtained with leſs labour and as much ſucceſs. I ſhall enter no farther into the hiſtory of theſe labours, and of the various methods propoſed, but to remark, that the directions given in the laſt edition of the London diſpenſatory, for the reaſons given above,

bove on the ſubject of the oleum ſuccini, do not ſeem to me ſufficient; and the directions given in the laſt edition of the Edinburgh Pharmacopæia ſeem to be more perfect and complete. The directions given there for the preſerving of this oil in its perfect ſtate, are particularly proper and neceſſary.

As we ſaid above, what I believe every body apprehends, that it is very difficult to explain the operation of antiſpaſmodics in general, I find the difficulty increaſes as we go farther in the conſideration of particulars. Here I have occaſion to take notice of a very particular circumſtance in this buſineſs. We find that a very volatile oil in the ſeveral æthers, and a very volatile oil procured by the management above mentioned, from either the foſſil, animal, or vegetable kingdoms, do all prove powerful antiſpaſmodics; ſo it appears to me that their power is very much in proportion to the volatility to which they are carried: for it is well known, that when their volatility, and with that their antiſpaſmodic power, is carried to the utmoſt, they are again readily changed by the contact of the air; and by this their colour, odour, and volatility, are much diminiſhed, and with theſe changes their antiſpaſmodic power is alſo greatly impaired. Here then is a ſingular connection between the volatility of oil and our nervous power; but how the former acts upon the latter we do not at all perceive: and particularly, how the former, by the loſs of its volatility, is brought into a ſtate leſs ſuited to the cure of ſpaſmodic affections, we cannot clearly diſcern.

WE have ſaid above, that theſe affections depend upon a ſtate of mobility in the energy of the brain; and we would now make another ſtep in alleging, that our volatile oils give, for a

certain

and thereby obtained the immediate relief of my patient. From many ſuch inſtances of the difference of muſk, I muſt inculcate upon all practitioners, that genuine muſk is a very powerful medicine, and that they ſhould not doubt of its efficacy on any occaſion, without their being certain that the failure was not owing to the imperfect ſtate of the drug. I muſt add, that the imperfect ſtate of muſk is not compenſated by a larger doſe.

WITH ſuch precaution in the choice of it, I maintain that muſk is one of the moſt powerful antiſpaſmodics that we are acquainted with. I have found it, with Dr WALL, to be a powerful remedy in many convulſive and ſpaſmodic affections, and in ſome of a very peculiar kind. I had once a gentleman affected with a ſpaſm of the pharynx, preventing deglutition and almoſt reſpiration. This, when other remedies had failed, was relieved by the uſe of muſk, which often ſhowed its power; for the diſeaſe continued to recur at times for ſome years after, and was only obviated or relieved by the uſe of the muſk.

SOME time ago the muſk had the reputation of curing the bite of a mad dog. Dr JOHNSTON has given us two facts that are very much in favour of its power: and I have been informed of an inſtance in this country of ſome large doſes of muſk having proved a cure after ſymptoms of hydrophobia had come on; but we have had no more inſtances of the ſame kind, and I leave its powers of this kind entirely to the judgment of the Société Royale de Paris.

IN another diſeaſe I can vouch for the powers of muſk, and that is in ſeveral circumſtances of the gout. The caſe given by Mr PRINGLE, in the Phyſical and Literary Eſſays, Vol. II. art. 12. are very much in favour of its virtues: and in ſeveral inſtances of the gout attacking the ſtomach, I have found it relieved by large doſes of muſk. I gave above an inſtance of headach and delirium, ariſing from the gout, being cured by it; and in the ſame perſon I had repeated inſtances of its power. This perſon being frequently affected with the gout, was liable to have it retrocedent, and affecting the ſtomach, the lungs, and particularly the head, in the manner above mentioned; and in many of theſe inſtances it was very ſuddenly relieved by large doſes of muſk, or by theſe at leaſt repeated after ſhort intervals; though at length the great irregularities of this patient brought the diſeaſe into a ſtate that reſiſted all remedies.

Musk has been employed by ſome in continued fevers; and I have had ſome experience of its uſe. It ſeems to be adapted to theſe caſes of convulſive diſorder which I have ſaid above are to be cured by opiates; and indeed the ſucceſs I have generally had with theſe has prevented my having further experience of the muſk.

Castoreum.

This alſo is an animal production, the natural hiſtory of which the public are well acquainted with. It is a pretty ſtrongly odoriferous ſubſtance, of the diſagreeable kind; and to this we aſcribe its medicinal powers. It is certainly on many occaſions a powerful antiſpaſmodic, and has been uſeful almoſt in every caſe requiring ſuch remedies, eſpecially when given [illegible] ſubſtance, and in large doſes, from ten to thirty grains. [illegible] been ſuppoſed by ſome to have ſomewhat of a narcotic [illegible] but I have never perceived this excepting where ſuch effects might be imputed to its removing the ſpaſmodic affections which interrupted ſleep. Its medicinal virtues are beſt extracted by a rectified ſpirit, as it is probable that this extracts moſt powerfully the odoriferous oil, upon which the medicinal quality probably depends.

THE Edinburgh College are of this opinion; but the London College prefer a proof-ſpirit. The latter may give a medicine to be employed more conveniently in a larger doſe than the former; but neither of them, in my opinion, can admit of doſes of much efficacy. Either of them may give a medicine to be ſuddenly diffuſed, and therefore of uſe in ſpaſmodic affections: but if that is the intention of the practitioner, it will be moſt certainly obtained by employing the compound tincture of caſtor, as preſcribed by the Edinburgh College.

SALES ALKALINI VOLATILES.

THESE ſhould have been put above, under the head of Stimulantia: for their ſtimulant is their moſt remarkable power; and this they ſhow in every doſe wherever the energy of the brain is weakened, and in conſequence the action of the heart is languid, or requires to be accelerated. In ſuch caſes this ſtimulus is among the ſafeſt, as it is always tranſitory; and when their acrimony can be covered, ſo as to paſs the mouth and fauces without irritation there, they may be given in large doſes from ten to twenty grains.

IT is not neceſſary to obſerve, that theſe volatile alkaline ſalts were formerly drawn from various animal ſubſtances, and ſuppoſed in conſequence to have peculiar virtues; but now the chemiſts have learned, that from whatever ſubſtances they may be extracted, they may be brought to ſuch a degree of purity as renders them hardly different from one another. They are ſtill however prepared in two different ways; the one of which is from ſal ammoniac, which gives the ammonia of the London

Diſpenſatory, or the ſal ammoniacus volatilis and ſpiritus ſalis ammoniaci of the Edinburgh.

These are certainly the pureſt forms of the volatile alkali, the moſt free from any adhering animal ſubſtances; but while the trade continues of preparing a volatile alkali from the bones or other ſolid parts of animals, there will come into our ſhops a ſalt and ſpirit that can hardly ever be ſo pure from ſome empyreumatic animal ſubſtance adhering: and it is a queſtion with me, Whether ſuch an adherence may not give ſome peculiar quality to the ſalt and ſpirit. I believe it does ſo, and may render it more antiſpaſmodic. This indeed cannot go far in any doſes of the ſalt or ſpirits given to adults; but it may go much further as employed in the ſpaſmodic affections of infants.

The liquid volatile alkali is commonly employed in its mild ſtate; but by a diſtillation of the ſal ammoniac with quick-lime, the alkali obtained may be in its cauſtic ſtate. In this ſtate it may be readily joined with ſpirit of wine, and gives the ſpiritus ſalis ammoniaci dulcis of the Edinburgh Diſpenſatory, or the ſpiritus ſalis ammoniaci vinoſus of the London. The combination affords an excellent menſtruum for diſſolving the ſeveral fetid ſubſtances employed as antiſpaſmodics, and renders them more ſuddenly diffuſible, and perhaps of more effect, in all ſpaſmodic affections.

The cauſtic volatile alkali is ſeldom employed by itſelf; but if its acrimony be covered while it paſſes the mouth and fauces, it may be employed with great ſafety. Its chief uſe, however, is when employed externally; and when ſmelled at the noſe, gives a more powerful ſtimulus than the mild alkali can do. Its acrimony is ſo conſiderable, that when applied to the ſkin, it readily irritates, and even inflames it; and may be ſo managed as to prove an uſeful ſtimulant and rubefacient in many caſes. But this requires its being blended with a mild expreſſed oil, in ſuch proportion as to prevent its inflaming too much; and in this ſtate it may be employed with great advantage, and particularly in paralytic caſes, with more advantage than the acids we mentioned before for that purpoſe.

PRACTITIONERS are now well acquainted with the uſe of this combination, under the name of the Volatile Oil, and find it uſeful in relieving all pains ariſing from rheumatiſm, when the ſkin is not already affected with redneſs; and it is even uſeful in relieving pains of the flatulent kind. This combination, to be very uſeful, requires to be made of one dram of good cauſtic alkali to an ounce of the oil; and it may even go frequently with advantage to double that quantity. Let apothecaries obſerve, that if the alkali does not entirely and intimately unite with the oil, and remain conſtantly united with it, it is a mark that the alkali was not ſufficiently cauſtic.

Of the ACTION *of* MEDICINES *upon the* FLUIDS.

HAVING now conſidered and explained, as well as we can, the action of medicines upon both the ſimple and living ſolid, I am next to conſider the action of medicines upon the fluids of the human body.

THE ſubject has occupied a great part of the writings on the materia medica; but, in my opinion, with no advantage. The doctrines have been often drawn from miſtaken facts; from an imperfect view of things; and commonly explained upon miſtaken

taken principles. Whether I ſhall be able to correct and improve the doctrine, I dare not determine; but it ſeems neceſſary to attempt it; and I ſhall do it as far as I am able.

THE principles I am to employ are perhaps very well underſtood by ſome chemical philoſophers; but they are ſtill far from being underſtood by the moſt part of phyſicians in any country of Europe, and particularly very imperfectly underſtood by writers on the materia medica. It ſeems therefore neceſſary to lay down the principles I am now to proceed upon; allowing them to be corrected and improved hereafter by abler philoſophers.

THE leading principle to be employed is this, that the qualities of bodies, as they appear to us, are eſpecially changed by ſeparation or combination; that is, by the ſeparation of mixts into their conſtituent parts, which in their ſeparate ſtate have qualities different from thoſe which appeared in the mixt; or by the combination of two or more ſeparate bodies, into a mixt or compound, which has qualities different from thoſe which appeared in the ſeparate parts.

ALL this is in general obvious; but in order to explain the latter caſe, we muſt now obſerve, that nature has eſtabliſhed between the ſmall parts of bodies an Attraction, as it is called, or a diſpoſition in a certain contiguity, to run into an union with one another, and to remain firmly united together.

THIS diſpoſition or this attraction does not however take place between all kinds of bodies, as there are many which have no ſuch relation; and of two bodies which have each of them an attraction to a third, the force of this is ſtronger with reſpect to this third body in the one than in the other, which is called an Elective Attraction. It is by this eſpecially that the ſeparation of the conſtituent parts of mixts is obtained; as when to a mixt body another is applied which has a ſtronger attraction to one of its conſtituent parts than they have to one another, the part having the ſtrongeſt attraction towards the body added paſſes to that, and leaves the other with which it was formerly joined by itſelf; and thus the conſtituent parts of a mixt may be ſeparated from one another, whilſt a new combination is at the ſame time formed.

To explain the ſeparation of mixed bodies, it is further neceſſary to remark, that the conſtituent parts of mixts may be ſeparated from one another by the action of heat or fire; and taking this into the account, we have all the ſeveral means of changing the qualities of bodies by ſeparation and combination.

IN this view of the matter it will appear, that, beſide the action of fire, the only other power in nature by which the qualities of bodies are changed is the relation of attraction which nature has eſtabliſhed between different bodies. What that relation depends upon, we have not, ſo far as I know, in any meaſure perceived. The ſmalleſt ultimate parts of bodies we have not, in any caſe that I know of, had a ſight of, ſo as to ſhow us any properties or conditions that might account for their ſeveral attractions, or their repugnance to it, which we call their Repulſion. The ſuppoſitions of the Corpuſcularian philoſophy have been gratuitouſly aſſumed, and might perhaps be ſhown, with reſpect to particular bodies, to have been univerſally falſe.

THE late diſcoveries, ſhowing acids to appear often in the form of an air, ſhould, I think, diſturb the notions of the Corpuſcularians. In ſhort, the Corpuſcularian doctrines have never explained to me any one phenomenon of nature; and it appears to be full time for us to give up our aſſuming them in our explanation of the qualities of bodies.

SOME changes in the qualities of aggregates may be obtained by a mechanical diviſion; but mechanical diviſion divides aggregates only into their integrant parts: and I know no inſtance of ſuch diviſion ſeparating the conſtituent parts of any mixt that takes place in the ultimate or ſmalleſt parts of the aggregate. If mechanical diviſion ſeems to change the coheſion of aggregates, I maintain it to be always by ſome relation of attraction operating by ſolution or mixture.

IT muſt in the next place be obſerved, that where bodies are to be changed by the combination of two different bodies, a certain proportion of the one to the other is always neceſſary to make any conſiderable change in the qualities of the new mixt; and if the portion of the one is very ſmall with reſpect to the other, though this may be equally diffuſed over the whole, yet the changes in the former qualities of the larger portion may be very inconſiderable, or hardly aſſignable. When, therefore, a quantity of matter, ſmall with reſpect to the whole of the fluids of the human body, is introduced into it, no conſiderable change can be made in the larger maſs; and this is a doctrine we ſhall have frequent occaſion to employ.

IT is however to be remarked here, that whenever it appears that a portion of matter, ſmall with reſpect to the whole of the human body to which it is added, has very conſiderable effects in changing the ſtate of it, that this muſt be either by the matter's acting primarily on the nervous ſyſtem, which may be moved by very ſmall quantities of matter, or that it muſt be by the matter's acting as a ferment; which by acting ſucceſſively on the ſeveral parts, may at length make a conſiderable change in the whole maſs.

HAVING thus laid down my general principles, I proceed to treat of the ſeveral medicines acting upon the fluids, under the ſeveral titles to which I have referred them in my catalogue. I might, as is uſually done, and as I have done in my general table, mention them as *Alterantia* and *Immutantia*, or as *Evacuantia*; but as I have no proper doctrine to deliver under the general head of Alterantia, I proceed to conſider the particular ſtate of alteration as the ſeveral conditions of it are explained in my general table, and in the detail of my catalogue.

CHAPTER IX.

DILUENTIA.

THE fluidity of the blood may be increaſed in two ways; that is, either by increaſing the proportion of fluid in it; or by diminiſhing the coheſion of the other parts. It is the firſt for which we employ ſtrictly the term and title of Diluentia; and the ſecond we are to conſider in the next chapter, under the title of Attenuantia.

WITH reſpect to the firſt, it is well known that the ordinary fluidity of the blood is owing to water, which in great proportion is conſtantly preſent in it; and that the chief, and perhaps only, means of increaſing its fluidity, will be by increaſing the proportion of water in it. We take it for granted that the blood, in the ſtate in which it is in living bodies, will always readily admit of a further proportion of water to be uniformly diffuſed in it, and thereby to increaſe the fluidity of the whole; and we cannot indeed diſcover that any other fluid can have this effect, but in proportion to the water which ſuch fluid contains. Water therefore is the proper, perhaps the only proper, diluent; and its effects as ſuch I am now to conſider more particularly.

AQUA.

THIS I formerly conſidered as a drink, and am now to conſider as a medicine; and in this light ſome have juſtly conſidered it as very univerſal. We formerly mentioned the ſeveral qualities of water neceſſary to render it fit for a drink; and it ſeems to be enough to ſay now, that the ſame qualities preciſely are what render it fit to be employed as a diluent; and as ſuch I proceed to conſider its operations.

NATURE having appointed water to be univerſally the drink of the whole animal creation, it is therefore in man the proper object of thirſt; and its firſt operation is to quench this appetite, and thereby remove a very uneaſy ſenſation, which is often a conſiderable irritation of the whole ſyſtem. It does this, not only by its coolneſs and ſimple fluidity, but alſo by its diluent power in diſſolving the viſcid matters of the internal mouth and fauces.

WHEN water is carried down into the ſtomach, it has there, according to its temperature and quantity, a very various operation. The effects of the former I have mentioned ſeveral times; to be therefore no further taken notice of here: and they are the effects of its diluent power only which I am now to conſider.

As the moſt part of mankind take drink along with their ſolid food, there can be little doubt that a certain portion of diluent drink, and particularly water, favours the ſolution and digeſtion of our ſolid food, and alſo contributes to the more ſpeedy evacuation of the ſtomach. The quantity neceſſary for this is very different in different perſons, and muſt be ſuited to the feelings of every individual; but with this obſervation, that a larger proportion than neceſſary, by increaſing the diſtention of the ſtomach, is ready to take off what appetite might otherwiſe remain; and it is commonly proper only, after the digeſtion is over, to throw in a quantity of water to finiſh that buſineſs more completely, and to promote the entire evacuation of the ſtomach.

NOT only for the aſſiſtance of digeſtion our diluent is neceſſary, but is alſo otherwiſe to the ſtate of the ſtomach itſelf. As the mucous glands of this organ throw out a large quantity of a heavy viſcid fluid, which, remaining in the ſtomach, gives an uneaſy ſenſe of weight, and impairs the appetite; ſo, in this morbid ſtate, a quantity of water, by diluting and favouring the abſorption and evacuation of this mucus, may often be the moſt certain remedy.

IT will be obvious, that in conſequence of theſe operations many and various diſorders of the ſtomach, and of the whole ſyſtem, may be removed by water taken into the ſtomach.

WHEN water is carried into the inteſtinal canal, it will, by mixing with the bile, diminiſh the acrimony of this, and obviate irritations that might otherwiſe have thence ariſen. By diluting the contents of the inteſtines, it will certainly promote the more entire ſolution of theſe, and, even by its bulk, favour their progreſs. But it is to be remarked here, that as water is intended to be copiouſly abſorbed here, ſo the effects we have juſt now mentioned will always be leſs and leſs as the alimentary maſs goes farther on, and will thereby allow it to come to a thicker conſiſtence; which will perhaps explain why the drinking of water ſo commonly contributes to a coſtive habit. At the ſame time it is to be remarked, that a large quantity of water, pretty quickly thrown into the inteſtines, may, by its bulk, increaſe their action, and thereby prove laxative; and I have known many inſtances of water operating in this way proving an uſeful remedy, by clearing out the whole of the contents, whether natural or morbid, which might be ſtagnant there. The common people, who commonly take in every thing that is under the name of a mineral water in very large quantities, often obtain much benefit from waters of no ſenſible impregnation, or at leaſt of any ſuch impregnation as would have no effect, if it was not from the bulk of water which accompanies it.

WHEN any unuſual quantity of water enters the lacteals or other abſorbents, it muſt contribute to increaſe the fluidity of their contents, and to expede their motions; and conſidering how much obſtructions in the conglobate glands are to be apprehended, the increaſing the fluidity of the liquor paſſing them may often be a means of obviating theſe obſtructions, or removing them when formed.

THE water entering the blood-veſſels by the thoracic duct muſt, in proportion, increaſe the fluidity of the whole maſs, and is certainly the means by which its fluidity is commonly preſerved.

IT is true, that even an unuſual quantity of water entering the blood-veſſels, enters ſo ſlowly, that it can hardly, before it be again withdrawn, increaſe the bulk of the whole, or give any unuſual diſtenſion; but the ſize of the veſſels is commonly ſo exactly adjuſted to the quantity of theſe, that I am perſuaded any unuſual increaſe in the quantity of fluid, though very ſmall, may give ſome degree of diſtenſion, and in ſome meaſure invigorate the ſyſtem.

THIS, however, in healthy bodies, or ſuch as are without any obſtruction of the excretions, cannot long ſubſiſt; for I hold it to be true, that any unuſual increaſe of the quantity of water in the blood will immediately paſs off by one or other of the excretions: and this paſſing off very immediately and largely by the excretions, we are now to conſider as a principal effect of water taken in.

WHEN an unuſual quantity of water has been thrown in, and paſſes off largely by urine, as it commonly paſſes off almoſt without colour, taſte, or ſmell, it may be ſuppoſed that it carries little of the ſaline matter of the blood along with it. This however cannot be ſuppoſed to be entirely the caſe; but that water, in this way, in ſome meaſure diminiſhing the ſaline matters formerly preſent, may thereby obviate and contribute to the cure of ſeveral diſeaſes; and further, although in this way its operation ſhould not be conſiderable, there is another effect of it to be taken notice of, which is, that the exciting and increaſing the action of the ſecretory and excretory veſſels muſt always be of conſiderable uſe to the ſyſtem.

ONE other remark is to be made.—Although it is probable that, by the conſtitution of the œconomy, any unuſual quantity of water be determined to paſs off by the excretions, rather than by the internal exhalants, this can hardly be ſuppoſed to be ſo entirely the caſe but that ſome portion of the abundant water will alſo paſs by the internal exhalants, and thereby, in ſome meaſure, dilute the ordinary halitus and the lymph that is abſorbed from it. By this means the diluted lymph will paſs along its veſſels, and be ſitter to obviate ſtagnations that might otherwiſe occur there. And whether, in this way, the large uſe of water may not contribute to the cure of ſcrophula, I leave my intelligent readers to determine.

FROM this detail of the operation of water, when joined with the effects of its temperature, explained elſewhere, it will readily appear that the abundant uſe of it, with very few exceptions, may be conſidered as a very general means both of preſerving health and of curing diſeaſes.

AFTER AQUA in my catalogue, I have ſet down the *aquoſa blanda;* by which I mean all thoſe fluids whoſe parts are *chiefly* water, without the addition of other matters that may either diminiſh the diluent qualities of it, or give it peculiar properties: and with theſe conditions I hold, that all aqueous liquors may have all the powers and properties I have aſcribed to ſimple water.

CHAPTER X.

ATTENUANTIA.

THESE are medicines ſuppoſed to increaſe the fluidity of the maſs of blood, and that without increaſing the proportion of the water in it, but by an operation upon the other parts of the maſs.

THE employment of this claſs of medicines ſeems to me to have proceeded upon the ſuppoſition that the preternatural ſpiſſitude of the fluids is owing to the ſmall parts of them uniting together, and thereby forming groſſer and more impervious maſſes.

THIS ſtate of the fluids is ſuppoſed to be corrected either by mechanical or chemical means. The firſt, it is ſuppoſed, may be done by a matter attenuating or diminiſhing the ſize of the preternaturally groſſer particles, or by a matter which divides and ſeparates the parts of theſe; and theſe laſt are named Incidentia, a term frequently occurring in writers on the materia medica. On the ſubject of theſe operations of attenuating and inciding, I would in the firſt place obſerve, that the ſuppoſition of the cauſe of the preternatural ſpiſſitude of the fluids is upon a miſtaken foundation; and I am diſpoſed to maintain, that there is no evidence of its ever taking place. *Secondly*, Though the ſuppoſition was better founded, I maintain, agreeable to the principles above laid down, that no ſuch mechanical operation can here take place. But, without entering farther into the queſtion, I chooſe to quote the following paſſage from the learned GAUBIUS. Although he was bred in the Corpuſcularian ſchool of BOERHAAVE, and has himſelf, in other parts of his work, admitted much of that doctrine, he had certainly entertained ſome doubts of its truth and propriety; and with reſpect to one particular of it, has given us the following paſſage. In the 300th paragraph of his pathology, he has the following words: "An et naturæ humanæ facultatis ineſt, moleculas, acres "detritis aut intropreſſis angulis in ſphærulas tornando blanditiem creandi? Non ſatis conſtat ſpeciolam ideam æqualiter "in fluidam ſolidamque acrimoniam quadrare. Credibilius "profecto mixtione chemica (298) magis quam mechanica rotundatione id opus perfici."

I DARE ſay the opinion of the mechanical operation of the attenuantia and incidentia will be deſerted by every body; and we have therefore only to conſider how their effects may be accounted for in a chemical way. Here however we meet with much difficulty. The change that happens in conſequence of the exhibition of theſe medicines, if any at all, cannot be rendered evident in fact; and the theory of any ſuppoſed operation is not to be readily explained. What can change the ſtate of the gluten is not well known; and we do not know of any matters applied to it out of the body that can diſſolve it, except a cauſtic alkali, which cannot be applied to it as it flows in the veſſels. Saline matters as applied to it, when it is drawn out of the veſſels, do prevent its uſual concretion, but theſe have no effect upon its conſiſtence; for, on a quantity of water being added, the gluten ſeparates from the reſt of the maſs, and ſhows the ſame qualities which it would have done upon any other occaſion. I muſt ſay the ſame thing of the red globules, that we do not know of any ſubſtances which, in the body or out of it, can change the ſtate of theſe; and therefore that we do not know of any ſubſtances which can change the conſiſtence of the blood with reſpect to its principal parts, which we might ſuppoſe to be the moſt ready to form preternatural concretions. If, therefore, any ſuch take place, it muſt be in the ſeroſity; but whether ever any ſuch concretions take place there, is not aſcertained as a fact: and the ſuppoſition is not ſuitable to what we know of the ſeroſity, which is always a ſaline fluid, poſſeſſed of a ſolvent power with reſpect to the other parts of the maſs of blood.

BUT however all this may be, if we can ſuppoſe that there may be concretions, or a diſpoſition to concrete, there may be room for attenuating medicines; and I have ſet down a liſt of medicines ſuppoſed to be of that kind.

OF theſe, the firſt I have ſet down is water, which perhaps need not have been repeated here; but I mention it to ſay, it is probable that this not only increaſes the proportion of water which is always ſeparate from the animal fluid, but that a portion of it may inſinuate itſelf into this, and be a means therefore of diminiſhing the force of coheſion in it.

THE next in my liſt are the

ALKALINA,

SUPPOSED to be powerful attenuants; but this does not appear to me to be on juſt grounds. It was originally ſuppoſed that they operated by their ſeptic powers; but the experiments of Sir JOHN PRINGLE have entirely exploded this opinion: and as to their otherwiſe ſolvent powers, I have already obſerved, that with reſpect to the gluten they are none at all; and if they act at all as attenuants, they muſt act merely by increaſing the ſaline ſtate of the ſeroſity, and therefore in the ſame manner as the matters I am next to mention do.

SALES NEUTRI.

THESE have been univerſally ſuppoſed to be attenuant, but on no certain foundation that I can diſcern. They may, as I have ſaid already, be employed in preventing the uſual concretion of extravaſated blood; but in no experiment do they ſhow any power in diſſolving or moderating the coheſion of the gluten. I have allowed that the ſaline ſtate of the ſeroſity has a chief ſhare in preſerving the fluidity of the whole maſs; and when the ſaline matter is in large proportion preſent, it may give an unuſual fluidity to the whole: but I cannot perceive that any ſuch quantity of neutral ſalts that are commonly employed as medicines can have ſuch an effect. An ounce of nitre, thrown in *par repriſes*, in the courſe of twenty-four hours, while a portion of it is at the ſame time conſtantly paſſing off by the excretions, cannot poſſibly be ever accumulated in ſuch quantity as to have any effect as a ſolvent. In the ſame manner I reaſon with reſpect to the other neutrals; and I proceed to conſider the next article of

Sapones.

Boerhaave was much diſpoſed to extend the idea annexed to this term, ſeeming to ſuppoſe that every combination of ſaline and oily matters might be conſidered as a ſoap. As ſuch a combination however takes place in almoſt every natural production, whether vegetable or animal, it is obvious, that as the qualities and proportions of the ingredients of ſuch mixts muſt be conſiderably diverſified, the chemical qualities and effects of them upon other bodies muſt alſo be ſo; and therefore the language of ſaponaceous muſt in chemiſtry be looſe and inaccurate; and the uſe of it in medicine muſt be in the ſame condition. As incapable of preciſion, it ſhould not be employed ſo promiſcuouſly and commonly as it has been done.

For the purpoſe of the materia medica we muſt aim at more preciſion; and I am here to conſider only what comes moſt commonly and ſtrictly under the appellation of *Soap*, which is a combination of fixt alkali with an expreſſed oil. The preparation of this has been ſo frequently deſcribed, and is ſo well known, that it need not be delivered here: and with a view to its chemical or medicinal qualities, it is enough to ſay, that it conſiſts in ſuch an exact and mutual ſaturation of the two ingredients with each other, that a new mixt is formed in which the qualities of the conſtituent parts very entirely diſappear. The alkali loſes the acrimony which it had in its ſeparate ſtate, and the oil now becomes readily miſcible with water, which it was not at all before; and the perfect ſtate of theſe properties is the mark of the preparation's being accurate and exact.

The medical conſideration of this ſubſtance firſt to be entered into is, that ſoap is ready to be decompoſed by any acid, however weak: and this circumſtance in the quality of ſoap is of great weight in our judging of its effects in the human body. As in our opinion the human ſtomach, in its healthy ſtate, is never without ſome acid preſent in it, ſo it is probable that any moderate quantity of ſoap taken into the ſtomach is always decompoſed by the acid of this cavity applied to the alkali of the ſoap; and this goes ſo far, that when acidity to a morbid degree prevails in the ſtomach, there is not a more powerful corrector can be applied to it than ſoap; and it is often a more convenient remedy than common abſorbents or ſimple alkalines.

When ſoap is thus decompoſed, what effect either the neutral formed from it or the oil ſeparated from it, may have in the ſtomach, hardly deſerves any attention; and what are the effects of its correcting the acidity of the ſtomach ſhall be conſidered hereafter.

Upon the ſuppoſition that ſoap is not decompoſed in the ſtomach, or that ſuch a quantity is thrown in as cannot be entirely decompoſed there, it may be an object of enquiry to determine what are its effects in different parts of the ſyſtem. As under a certain management ſoap may diſſolve the moſt part of vegetable or animal concretions, a ſpecious foundation has been laid for ſuppoſing its attenuant power with reſpect to the human fluids; and very poſſibly it may be of uſe in reſolving the viſcidities that may be ſuppoſed to occur in the alimentary canal; though, conſidering the diluted ſtate in which it muſt be applied, its operation cannot be very powerful; and this will apply more ſtrongly with reſpect to its effects, as it proceeds farther in the ſyſtem.

In the inteſtines it has been ſuppoſed to be a laxative; but except when taken in very large quantity, I cannot perceive its operation. When it does happen, it muſt be owing to the common ſalt that is employed in its preparation, and which in part adheres to it: for when this is ſeparated, the ſoap becomes a perfectly mild ſubſtance, not likely to give an irritation to parts of the greateſt ſenſibility.

IT has therefore been a frivolous practice to employ ſoap as a laxative in glyſters. It may perhaps be of ſome uſe in ſoftening hardened fæces; but as a ſtimulus it can act only by its common ſalt; and a quantity of this may always be added with leſs trouble than the addition of the ſoap.

WHEN ſoap is carried into the blood-veſſels, it may be ſuppoſed to have ſome attenuant power; but I muſt hold this to be very doubtful, and it can never be conſiderable. When we conſider that it cannot be thrown in, in any large quantity, and that only in ſome length of time; and when taken in, as it is much divided and diffuſed over the whole maſs of blood; we cannot ſuppoſe it to be in any part of this maſs in ſuch quantity or concentration as could have any effect in reſolving viſcid concretions even out of the body; and therefore we muſt hold the ſo-much talked of power of ſoap, in reſolving obſtructions, to be very inſignificant

WHILE it has been ſuppoſed that ſoap may be of uſe in reſolving obſtructions of the liver, it has been a conſequence of that ſuppoſition, to judge that it may be uſeful in jaundice; and as uſeful in that caſe, it has been univerſally recommended by materia medica writers. I imagine it however to be upon a ſlight foundation. The arguments I have employed againſt the reſolving powers of ſoap lead me to think that it cannot reſolve biliary concretions, which it does not do even out of the body; and in perſons frequently liable to ſuch concretions, I have known the ſoap employed without any effect. When a jaundice is actually produced by a biliary concretion falling down into the biliary ducts, that ſoap can do any thing towards diſſolving or puſhing on that concretion, is not in the leaſt probable. It is therefore that it has been unreaſonably recommended in jaundice: but I have frequently employed it; and by its correcting the acidity of the ſtomach, and in ſome meaſure obviating the argillaceous conſiſtence of the fæces, I have found it uſeful.

I MUST not diſmiſs the conſideration of the internal uſe of ſoap without acknowledging that it has often appeared to be uſeful to the ſyſtem; but it has only appeared to me to be ſo in calculous and gouty caſes, which I aſcribe entirely to its correcting the acidity of the ſtomach; the explanation of which has been already hinted, and will be more fully conſidered in the ſequel.

NOTHING has been more frequent than the commendation of ſoap for external uſe; and as it is commonly employed, it ſeems to be well founded. We ſpoke above of the great benefit of friction employed by means of oil; and as ſoap alſo affords a convenient medium, ſo the friction employed with this is often a powerful means of reſolving various obſtructions on the ſurface of the body, and at the ſame time of the ſubjacent parts. At the ſame time, as it is convenient enough for admitting the antiſpaſmodic power of camphire, and the ſtimulant and rubefacient power of eſſential oils, we may readily perceive that ſoap very properly forms the baſis of ſome powerful external remedies.

DULCIA.

IN entering upon the conſideration of ſugar, which I have before repreſented as an alimentary matter, it naturally occurs to us to remark, that a choice of diet ſhould be the moſt obvious and certain means of giving the proper conſiſtence, or the other neceſſary qualities, to the maſs of blood. This appears to be juſt; but the application of it is not ſo eaſy as might be imagined. The blood of the phytivorous animal hardly differs from that of the carnivorous; or, at leaſt, the difference has not been clearly aſcertained. What we are more certain of is, that men live upon very different aliments, and at the ſame time produce blood of no apparent diverſity. This alſo is perhaps not exactly true; but I maintain that phyſicians have not yet learned to mark the different ſtates of the blood in men of ordinary health. This will readily appear from the accounts that have been given of it. See Halleri Elementa, lib. v. ſec. 2. art. 8. and conſider what we have ſaid above, Introduct. chap. I art. 2. From all which it will appear, that we are not in a condition to determine the effect of aliments upon the ſtate of the blood. It is probable that they give ſome difference; but it is at the ſame time probable that the different ſtate of the blood depends more upon certain differences in the general œconomy than upon the diverſity of aliment.

I proceed therefore to conſider what may be the effect of ſugar, and of ſaccharine matters, when taken into the body in large quantities. I hope, that when treating of aliments in general, I ſufficiently proved that theſe matters enter largely into the compoſition of the proper animal fluid, and make a part of the nouriſhment of the body; and from the facts adduced, it is highly probable that they may be taken in with perfect ſafety in very large quantities: and in proof of this many extraordinary facts are adduced. What limits may be ſet to this, is with me very uncertain; but we ſhall allow that there may be limits in this reſpect, and that whenever it happens that more ſugar is taken in than can enter into the compoſition of the animal fluid, it muſt remain in its ſeparate ſtate, and may then be conſidered as a medicine that may have particular effects on the whole of the fluids.

UPON this ſubject it has been commonly ſuppoſed that ſugar is an attenuant; that is, increaſes the fluidity of the whole maſs, and may obviate and reſolve concretions that might or do actually happen in our fluids. It may be ſo, but there is no proof that I know of given of the fact; and there are no experiments made out of the body that ſupport the opinion. Its antiſeptic powers fully eſtabliſhed are againſt thoſe of its being an attenuant. What effects it may have when very largely introduced, or when generated in unuſual quantity in the ſingular caſe of diabetes, I dare not determine. The noxious qualities that have been ſometimes aſcribed to it are neither clearly proved nor aſcertained; and the experiments of the late ingenious and induſtrious DR STARK do not appear to me to be anywiſe complete or concluſive.

IT remains therefore ſtill to ſay what are the medicinal qualities of ſugar, when preſent in any unuſual quantity in the maſs of blood. It appears to me that they are no other than that of a mild ſaline ſubſtance, that will readily paſs off by the excretions, and probably expede and promote theſe; and this is the only medicinal virtue I can aſcribe to it.

ON the qualities of ſugar, it was hardly neceſſary to obſerve, that in certain ſtomachs it may be diſpoſed to an aceſcent fermentation; and when from the ſtate and circumſtances of the ſtomach this happens to be in exceſs, ſugar may have all the effects of other aceſcents.

WHEN ſugar is carried unchanged into the inteſtinal canal, it ſeems to ſtimulate theſe, and prove laxative; and the uſe of it in glyſters is in proof of this: but when taken in by the mouth, its laxative effects hardly appear, except when it is taken in large quantity; and when indeed the laxative quality of ſugar appears to be conſiderable. I am of opinion that it is moſt commonly from its having been brought from the ſtomach into the inteſtines in an acid ſtate, and when therefore, like other acids, being mixed with the bile, it may like thoſe others induce a diarrhœa.

MEL.

THIS is ſo exactly and entirely a ſugar, that I am at a loſs to find in it any qualities or virtues different from thoſe of ſugar. It may commonly have ſomewhat more viſcid adhering to it; but what effect this has upon its qualities I cannot perceive: and whatever they are, they may be taken away by clarifying with white of egg.

RECENT honey has a matter in it which in certain perſons readily excites an aceſcent fermentation and ſpaſms of the ſtomach, which are called Colics. What is the peculiar matter here preſent we cannot diſcern; but it ſeems to be volatile, as it is readily diſſipated by boiling. The effects of the recent honey we ſpeak of do not take place in every perſon, and in thoſe only of a peculiar idioſyncraſy; and to ſuch perſons honey ſhould not be given without having been boiled.

As I have ſaid that the medicinal qualities of honey are not different from thoſe of ſugar, there is no foundation for what might have been neceſſary in ancient times; that is, for making honey the baſis of ſyrups. The London College ſtill continue the practice; but for what purpoſe in medicine I cannot conceive.

ceive. In my opinion, the Edinburgh College have properly laid it aſide, for ſeveral reaſons. Our country apothecaries would not always take the trouble of clarifying their coarſe honey; and fine honey is almoſt always dearer in this country than ſugar.

I HAVE ſaid that I do not know any difference of medicinal quality in ſugar and in honey: but I am not poſitive in this; for I have had ſome reports of benefit obtained by certain aſthmatics from the large uſe of honey: and if it be poſſible that honey is in any meaſure diſpoſed to go by the exhalants of the lungs, there may be a foundation for this; but it is not yet aſcertained that ſugar taken in the ſame quantity would not have had the ſame effect. In ſome of the inſtances reported as above, the honey was taken to the quantity of ſeveral ounces every day.

GLYCYRRHIZA.

THIS is a well known root, which affords a large proportion of ſaccharine matter; and when that is extracted by itſelf, it does not differ from common ſugar, and therefore does not differ from it in any of its medicinal qualities.

THIS is particular with reſpect to it, that beſides its ſweet ſubſtance, it contains a bitteriſh diſagreeable matter, which, however, is only extracted by long boiling; and this therefore directs, that to obtain the ſweet and avoid the bitter, the liquorice ſhould always be treated by ſlight and ſhort boiling. This practice is now commonly eſtabliſhed; and I mention it only to take notice of what has been much obſerved, which is, that while all other ſweets excite thirſt, liquorice takes it off, and was therefore anciently named Αδιπσον. To explain this, I obſerve, that in the ſweet of liquorice, ſeparate from the root, I do not find that it quenches thirſt more than other ſweets; and I take the miſtaken notion to have ariſen from this, that if a piece of the root is chewed till the whole of the ſweetneſs is extracted, that further chewing brings out the acrid and bitteriſh matter, which ſtimulates the mouth and fauces ſo as to produce an excretion of fluid, and thereby takes off the thirſt which the ſweetneſs had produced.

I HAVE only further to repeat, that as the ſweet of liquorice is no other than that of ſugar, ſo we can aſcribe no other medicinal qualities to it. It is alleged that it has ſome mucilaginous matter joined with its ſweetneſs, by which it may be a more powerful demulcent than ſugar; but this we ſhall have occaſion to conſider further under the article of Demulcents.

FRUCTUS DULCES SICCATÆ.

I THOUGHT it proper to mention theſe here among the dulcia; and I think properly enough, as they contain a large proportion of ſugar, and have every property of this. I do not however allow them to have any more attenuating powers than ſugar itſelf; but ſome of them ſeem to have more of a mucilaginous matter mixed with their ſugar, and may therefore have a more demulcent quality, as we ſhall ſay by and by.

CHAPTER XI.

INSPISSANTIA.

IF it had not been in complaiſance to the common ſyſtem, and to give a ſeeming conſiſtency to my own, I ſhould not have inſerted this title; for I do not know the application of it in the practice of phyſic. If the general conſiſtence of the maſs of blood is to be increaſed, I do not know any other means of doing it than by diet and exerciſe: for I do not know of any medicine that can give a more denſe conſiſtence to the animal fluids, or a greater proportion of the denſer fluids to the whole.

I HAVE ſet down here two ſubſtances which may increaſe the coheſion of the parts; but I think they cannot be introduced ſo as to have any ſuch effect: and I have ſet them down here merely to obviate a miſtake that might ariſe with thoughtleſs chemiſts, who might imagine that every portion of theſe fluids might have ſome tendency to coagulate or thicken the maſs of blood. It is however certain, that neither acids nor alcohol, except in their very concentrated ſtate, can have any ſuch effect; and it is equally certain that they cannot poſſibly be introduced by the mouth, without ſuffering ſuch a dilution as muſt entirely deſtroy their coagulating powers.

THEY have, I believe, been hardly thought of as inſpiſſants; and the purpoſe of inſpiſſation has been commonly propoſed to be executed by introducing ſubſtances of a thicker conſiſtence than uſual; and which, if they could remain in the body in that condition, might perhaps anſwer the purpoſe: but we are clearly of opinion that all of them, before they can be introduced into the blood-veſſels, muſt be reduced to the ſame ſtate of fluidity that our fluids ordinarily have; and therefore, that the purpoſe of inſpiſſating cannot by theſe be obtained.

CHAPTER XII.

DEMULCENTIA.

THESE are medicines ſuited to obviate and prevent the action of acrid or ſtimulant matters; and that, not by correcting or changing their acrimony, but merely by involving it in a mild and viſcid matter, which prevents it from acting upon the ſenſible parts of our bodies. We have mentioned before the uſe of oil for this purpoſe, in covering both acids and alkalies; and even the vitriolic acid may be in a great meaſure covered by being mixed with a mucilage of gum Arabic.

THESE effects of demulcents are ſufficiently evident with reſpect to the external parts; and it may be preſumed that the ſame may happen with reſpect to the internal, ſo far and ſo long as the acrid continues mixed with the demulcent. But here the difficulty occurs, to ſuppoſe that the demulcent matter retains its mild and inviſcating quality, after it has been taken into the body. To cover acrimony it is neceſſary that the demulcent ſhould be of a conſiderable degree of viſcidity; and when it is ſuch as can be diluted with water, a conſiderable dilution greatly diminiſhes its power, and renders it almoſt none at all. But the moſt part of demulcents cannot be long in the ſtomach, or in paſſing through the inteſtines and other paſſages into the blood-veſſels, without ſuffering a dilution that muſt take off its viſcidity altogether.

AND it is further probable, that demulcents being commonly of a nutritious kind, they muſt, by the power of the gaſtric liquor, and perhaps by a fermentation they undergo in the ſtomach, be rendered of the ſame fluidity with the other aqueous fluids of the body. All this reaſoning I can employ with reſpect to the demulcents; ſuch as the mucilages and ſweets which are of an aqueous nature, to afford this concluſion, that ſuch demulcents can have no effect as ſuch in the maſs of blood, or in paſſing by the various excretions.

WITH reſpect to the oily demulcents, the matter is not ſo obvious; but conſidering what we have ſaid above of the diffuſion, and even mixture of oil in our fluids, it will be probable that no quantity of it can be commonly preſent in the maſs of blood, ſo as to act as a demulcent, or in their oily ſtate to paſs off by the excretions.

WE have indeed alleged above, that oil is a matter fitted to inviſcate the vegetable acid taken into the body; but by that very mixture the form of the oil is changed, and loſes its fitneſs to be an inviſcating matter. There is indeed another argument that might be employed in favour of the inviſcating, and if you will, demulcent, nature of oil. It has been obſerved, and we have pointed it out above, that when an acrimony, in conſequence of certain diſeaſes, prevails in the maſs of blood, an abſorption of the oil which has been formerly laid up in the adipoſe membrane takes place; and it is with great probability ſuppoſed, that in this nature intends that the abſorbed oil ſhould cover the prevailing acrimony; and this ſuppoſition preſumes that the oil is fitted for this purpoſe. All this is probable; but that it will apply to ſhow that oil taken in by the mouth will act as a demulcent, is to me very doubtful. In the other caſe of abſorption, there may be circumſtances, both in the nature of the acrimony prevailing, and in the ſtate of the oil abſorbed, which we do not know with any exactneſs.

To conclude the ſubject of the demulcent power of oil, I muſt obſerve, that the oil commonly preſent in the blood, or even copiouſly introduced, is not a demulcent with reſpect to ſome acrimonies taken into the body. The vitriolic acid paſſes copiouſly by the ſkin in its acid ſtate when it cures the itch; and the muriatic acid is found ready to irritate iſſues and open ulcers: and we might give other inſtances of acrid matters paſſing by various ſecretions in their acrid ſtate, notwithſtanding that a great deal of oil is at the ſame time taken in.

FROM theſe conſiderations it ſeems probable, that the operation of demulcents in covering acrimony in the maſs of blood muſt be very inconſiderable; and therefore, that they do not allay coughing by covering that acrimony, which, exhaling from the lungs, and applied to the glottis, excites that uneaſy motion. But it is certain, that the taking in of demulcents often allays coughing, and ſuſpends the repetition of it for ſome time; and this, without having recourſe to their operation in the maſs of blood, may be accounted for in another way. As coughing is ordinarily excited by a halitus or vapour of ſome acrimony, ariſing from the lungs, and irritating the very ſenſible parts of the glottis and its neighbourhood; ſo by beſmearing theſe parts with a demulcent matter, we may often avoid the irritation we ſpeak of, and therefore the frequency of coughing. Accordingly, medicines perfectly mild and free from acrimony, but of conſiderable viſcidity, being ſwallowed leiſurely, ſo that they may adhere to the fauces, anſwer theſe purpoſes.

AFTER theſe general conſiderations, I ſhall offer a few remarks upon the particulars that have been employed; leaving it to the practitioner to employ them or not as he ſhall judge proper.

ASPERI FOLIÆ.

SYMPHITUM.

SOME other of the aſperi foliæ contain a portion of mucilaginous matter; but it is not in common to the whole of the order, and I have ſet down only two that have been chiefly in uſe.

THE root of the ſymphitum gives out a large proportion of a mild mucilaginous juice, and perhaps in larger proportion than almoſt any other root; and therefore, while mucilaginous matters are retained in our liſts, I do not perceive why both the Britiſh colleges have entirely omitted the ſymphitum. It may be of ſervice, as alleged, in diarrhœas and dyſenteries; but that it has ever been of uſe in hæmoptyſis, for the reaſons given above, I cannot admit.

CYNOGLOSSUM.

THE root of this affords ſo little mucilage, that it is not to be taken notice of on this account; but it has been formerly conſidered as having ſomewhat of a narcotic quality, and its ſenſible qualities might lead to a belief of it; but trials made on purpoſe to examine this have not at all confirmed it.

MUCILAGINOSA.

THESE are the medicines eſpecially truſted to in practice as demulcents; and I have ſet down the chief of them, which are the moſt pure and ſimple mucilages which nature affords.

GUMMI ARABICUM.

To this I have ſubjoined the *gummi ceraſi*, to ſhow, that where it can be had in tolerable purity, it may be employed for every purpoſe of the foreign gum Arabic.

THE gum Arabic is the mucilage moſt univerſally employed, becauſe it can be introduced in the moſt concentrated ſtate, and therefore eaſily in the largeſt quantity; and its demulcent qualities are ſuppoſed to be very conſiderable. They are ſuppoſed to reach the bronchiæ, and thereby to correct the acrimony that occaſions coughing, and eſpecially ſuppoſed to reach the urinary paſſages, and there to cover any acrimony prevailing in the urine. This is a doctrine ſo univerſally prevailing among phyſicians, and ſo generally followed in practice, that I had great difficulty in truſting my own judgment in admitting any doubts concerning it; but after much reflection, the reaſons employed ſtill prevail with me, and perſuade me, that even gum Arabic, as an internal demulcent, can be of no ſervice beyond the alimentary canal. Beſides the general reaſoning above with reſpect to this gum, the one taken from the quantity thrown in is of much weight with me. In common practice, hardly more than a few ounces are given in one day; and what that can give of a mucilaginous quality to many pounds of ſeroſity, I leave my intelligent reader to judge. Still however it may not be thought enough to reaſon *à priori*, and I ſhould ſay what experience has actually taught. What others may have obſerved I cannot determine; but, for myſelf, I can aſſert, that, in innumerable trials, I have never obſerved the effects of gum Arabic in the maſs of blood, or in the excretions derived from it. The moſt frequent occaſion for its uſe is in the ardor urinæ; and in that I have been often diſappointed, and have often found, that two pounds of water, or watery liquors, added to the drink, would be of more ſervice than four ounces of gum Arabic taken in without ſuch addition.

TRAGACANTHA.

AFTER what I have now ſaid on the ſubject of gum Arabic, I need not ſay that the tragacanth, though more powerful as a mucilage, cannot be of any greater uſe as a demulcent.

AFTER theſe gums I have ſet down the *Amylum*, as, with a little water, it forms a conſiderable portion of mucilage; and in this ſtate it may be of uſe in the great guts in the caſe of dyſentery, but its demulcent powers cannot be conſiderable; and even in the caſes of dyſentery might be better obtained, and with leſs trouble, from other ſubſtances.

ICTHYOCOLLA.

AFTER the vegetable, I have here ſubjoined the animal mucilages, the moſt powerful of which is the icthyocolla. This may afford an uſeful medicine in the alimentary canal; but that it goes farther I cannot admit of: and all the arguments I have employed above againſt the power of demulcents, will, in my opinion, apply equally here.

WITH reſpect to this article, and to the one that follows the *gelatinæ ex rebus animalibus*, I would add, that there is another argument againſt their retaining their mucilaginous quality in the blood-veſſels and excretions, which is, that as animal ſubſtances, from the nature of the animal œconomy, they muſt be conſtantly approaching to a putreſcent ſtate, and in proportion to this, have their mucilaginous quality deſtroyed.

OLEOSA BLANDA.

How far theſe can in any caſe prove demulcents, I cannot poſitively determine; but, in my introduction to this chapter, I have conſidered the matter as fully as I can, and need not repeat any thing here.

CHAP-

CHAPTER XIII.

ANTACIDA.

THAT there is almoſt perpetually in the human ſtomach a quantity of acid of the nature of the vegetable acid from which it is derived, cannot, in my opinion, be doubted; and that it is very often copiouſly preſent there, every body knows. From theſe appearances, it might be ſuſpected that a quantity of the ſame acid might paſs unchanged into the maſs of blood, and be often preſent there. Dr BOERHAAVE, in writing his Aphoriſms, ſeems to have been of this opinion, and mentions the ſuppoſed effects of an acid prevailing in the maſs of blood. But afterwards, on reflecting on the general tendency of the human œconomy to a putreſcent ſtate, he ſeems, in his chemiſtry, to have deſerted his former opinion; and the ſuppoſition of an acid in the maſs of blood has been deſerted by all his followers, and indeed by every phyſician ſince. The medicines, therefore, comprehended under the title of this chapter, have been conſidered as adapted only to the correction of acidity in the alimentary canal.

SOME years ago I ſhould have been of this opinion, but ſome late diſcoveries have given me better inſtruction. By the analyſis of the urinary calculus by SCHEELE and BERGMAN, we are taught that this concretion is formed by an acid; and BOERHAAVE's experiments ſhow, that a matter fit to form ſuch a concretion is conſtantly preſent in the moſt healthy urine, and ready to form ſuch a concretion whenever a matter fit to favour its accretion is preſented to it. All this ſhows, that the acid often copiouſly taken in is not entirely deſtroyed in the courſe of the circulation, but ſubſiſts, and is carried to the remoteſt paſſages. All this may make ſome changes in our phyſiology of the fluids: but I am not ready to proſecute this here, and can only at preſent make ſome application to the pathology of the urinary calculus, and even this I cannot carry far. I cannot ſay what are the means of determining the different quantities of calculous matter at different times preſent in the urine; what are the various circumſtances that determine its concretions; and particularly, what are the cauſes of the uneaſineſs and pains that ariſe from calculi formed: I find all this to be extremely difficult; and I ſhall not attempt to ſolve theſe, and perhaps ſome other problems that might ariſe.

I MUST be ſatisfied now with what ſeems to be enough for my purpoſe; which is, to obſerve what experience has ſhown, that antacid and alkaline ſubſtances are what have given the moſt certain relief in the moſt part of calculous caſes.

THIS has been long ago known; and phyſicians have very often gone into the opinion, that the relief obtained in ſuch caſes

ſes was by the medicines diſſolving the concretions that had been formed in the kidneys or bladder; and it is not yet abſolutely determined whether they ever do or not. I am indeed of opinion that they do not; but it is by no means neceſſary to determine the queſtion, as we allow it to be proper to employ them wherever they conveniently can be. In the mean time, it is enough for me to remark, that it is now ſufficiently certain, that alkalines do not always diſſolve the ſtones in the urinary paſſages; but, in many caſes, without diſſolving the calculi, they certainly relieve the pain and uneaſineſs which the preſence of the calculus occaſions; and therefore, upon every ſuppoſition, their employment is proper: and I proceed to what may be ſaid of the adminiſtration of

PARTICULAR ANTACIDS.

I HAVE ſet down a pretty long liſt; but it is not neceſſary to take much notice of each of the particulars. The

LAPIDES CALCARIÆ,

CRETA, and the ſeveral TESTACEA, are much of the ſame nature, and are eſpecially fitted for correcting the acidities of the prima viæ, and for that purpoſe may be uſed in large quantities; and ſome have imagined, that by being joined with the acid of the ſtomach, they may become aſtringent: but I have not obſerved this; and if it does ever happen, I believe it is a rare occurrence. They ſometimes ſeem to be of ſervice in diarrhœa; but this I impute not to their aſtringent quality, but merely to their correcting acidity, which, by being mixed with the bile, had occaſioned the diſeaſe.

THE CORALLIUM and CORALLINA are alkaline and abſorbent; but the preſent practice neglect them as unneceſſary.

THE CORNU CERVI USTUM is ſtill retained in the liſt of the London diſpenſatory; but as it is the weakeſt of all the abſorbents, and has not, ſo far as I know, any peculiar virtues, I think it might have been omitted as it is by the Edinburgh college.

MAGNESIA.

THIS may be employed as an abſorbent, as it does not differ in its chemical qualities from the others mentioned; but in its medical, it differs from all the others, as, when joined with a vegetable acid, and ſuch as it commonly meets with in the human ſtomach, it proves a laxative, operating much in the ſame manner, though not ſo ſtrongly, as the magneſia glauber ſalt.

THE ANTACIDS hitherto mentioned are chiefly employed for correcting the acidities of the ſtomach, and have not been commonly employed in the caſes of calculi as mentioned above, though, upon our theory, they might be, and ſometimes have been, with advantage. It would appear that they cannot be conveniently employed in ſuch quantity as to abſorb ſo much acid as ſeems neceſſary to give ſo entire relief in calculous caſes as is to be wiſhed. It has therefore been found neceſſary to have recourſe to the alkaline ſalts; and ſuch I conſider the impregnation of LIME-WATER to be. This we have known in ſeveral inſtances, when taken in large quantity, to be ſufficient for the purpoſe; and with reſpect to it, I have only to remark, that from many trials, the lime-water made from common limeſtone

ſtone is equally effectual, and generally more agreeable, than that made from a lime prepared from any of the teſtacea.

As there may be imperfections in preparing lime-water, and as it is frequently inconvenient to give it in ſufficient quantity, ſo practitioners have of late years depended upon the uſe of the proper alkaline ſalts; and as I am perſuaded that theſe, from ſeveral conſiderations, are moſt effectual in their cauſtic ſtate, ſo I have frequently obſerved the good effects of it in that ſtate, as it has been commonly exhibited in what has been called CHITTICK's medicine. This however has frequently failed; and I impute its failure either to its not being properly adminiſtered, or to its not being given in ſufficient quantity.

IN order to relieve the uneaſineſs ariſing from calculi, I know from much experience that it is neceſſary that the alkaline remedy ſhould be exhibited in conſiderable quantity, and very conſtantly. But for this purpoſe, on account of its acrimony, it is not eaſy to exhibit the pure alkali, unleſs ſome meaſure is contrived for covering it in the mouth and fauces. Such a meaſure might be ſuppoſed to be the employing ſoap; and I have accordingly found it, in ſome caſes, employed with great advantage. But there are ſeveral inconveniencies that prevent the employment of it in large quantity; and though there might be means of obviating theſe, I do not enquire after them, as we have found another means of anſwering our purpoſe that is commonly very effectual. This is done by ſaturating a pure fixed alkali with the *aerial acid.* This covers the acrimony, and any thing diſagreeable in the alkali; which therefore can be taken down into the ſtomach in large quantity: and as this acid is readily ſeparated by the acids ſo conſtantly preſent in the ſtomach, it allows it to have all the effect in correcting the acidities of the ſtomach that can be wiſhed for, and has now been found by frequent experience to relieve all the uneaſineſs ariſing from calculi more certainly and more completely than any other remedy formerly tried. The apparatus and meaſures neceſſary in making this preparation are now ſo commonly known, that I do not think it neceſſary to inſert them here.

CHAPTER XIV.

ANTALKALINA.

HAD it not been to give ſome appearance of ſyſtem, and from my complaiſance to Dr Boerhaave, who treats *de Morbis ex Alkali ſpontaneo*, I ſhould not have admitted of this chapter; for I am well perſuaded, that no alkaline ſalt, in its ſeparate ſtate, ever exiſts in the blood-veſſels of the living human body. The doctrine of Boerhaave, which I have juſt mentioned, is, in almoſt every part of it, incorrect and erroneous, and leads to no occaſion for the uſe of antalkalines; and the only occurrence that can require them is a very rare one, that of a pure alkali being thrown in by miſtake or accident into the ſtomach; and the means of taking off its irritation by acids is ſufficiently obvious: only this farther is to be remarked, that as the alkali, in any noxious quantity, cannot have been introduced without hurting the mouth, fauces, and æſophagus, ſo it is always neceſſary, in ſuch caſes, along with the acids, to employ the large uſe of diluents and demulcents.

CHAPTER XV.

ANTISEPTICA.

THAT there is, in the animal œconomy, a conſtant tendency to putreſcency and putrefaction, is now admitted by every phyſician. The complete putrefaction cannot, in any conſiderable portion of the body, take place without extinguiſhing life; and therefore a competent putrefaction is not a diſeaſe of a living body that can be an object of practice. It is the tendency to it which, in any conſiderable degree, produces various morbid diſorders, and requires the utmoſt ſkill of our art to prevent. By what ſteps this tendency proceeds, and in what different degrees it may appear, we do not clearly underſtand; and therefore, to this tendency, in all its ſeveral degrees, I have given the general name of Putreſcency; and the medicines ſuited to moderate and correct this I name Antiſeptics, and have endeavoured to enumerate them in this chapter.

THE liſt is taken from experiments made out of the body; and even there they ſhow their power to be in various degree, and manifeſtly to be more or leſs ſuited to application in the living body. But before proceeding to conſider that, I muſt obſerve, that the ſtate of putreſcency in the living body ſeems to be in different conditions, and requiring therefore different remedies. The one I call the Acute, the other the Chronic, Putreſcency. The firſt attends febrile diſorders of various kinds; and, if I miſtake not, appears upon occaſion in fevers of every kind. The chemical condition of the fluids in this putreſcency I do not pretend to determine with any clearneſs. But, in my Firſt Lines, on the ſubject of the Prognoſtic in Fevers, I have endeavoured to mark the various ſymptoms by which what I judge the putreſcent ſtate of the fluids may be aſcertained, and to remedy which our antiſeptic remedies are to be applied.

THE other ſpecies of putreſcency, which I have called the Chronic, is, as I judge, what appears in ſcurvy; and although the nature and chemical ſtate of the fluids in this diſeaſe are not well aſcertained, yet I think it enough that, as the ſymptoms of the diſeaſe are well known, and for the moſt part characteriſtically determined, I may ſpeak of it as an object of the application of antiſeptic remedies, which are often employed in the cure of it with advantage. Of theſe, in particular, as enumerated in my catalogue, I would now proceed to ſpeak; but muſt firſt make a remark that muſt in ſome meaſure correct the general ſyſtem.

I HAVE ſaid that one ſtate of putreſcency is that which eſpecially accompanies febrile diſorders; but I believe that the ſame ſtate may occur without having any fever joined with it. We have ſeen ſeveral inſtances in which numerous petechiæ have appeared on the ſurface of the body, without any fever appearing at the ſame time: but as with theſe petechiæ there occurs a fetid breath and ſpongy bleeding gums, theſe with the petechiæ have been conſidered as marks of a putreſcent ſtate of the fluids.

I HAVE known one inſtance which ſeems applicable to our preſent conſideration: This was a woman who lived very conſtantly upon vegetable aliment, and had not been expoſed, ſo far as could be judged, to any febrile or putrid contagion, was, without feeling any other diſorder, affected with numerous petechiæ over the whole ſurface of her body. After theſe had continued for ſome days, without any ſymptom of fever, ſhe was affected with ſwelled and bleeding gums, with fetid breath and much thirſt; and in the courſe of a week or two more, almoſt every ſymptom of a putrid fever came on, and in a few days proved fatal.

SUCH caſes, with the petechial caſes above mentioned, ſeem to ſhow that the human fluids, without fever, and without the cauſes of ſcurvy having been applied, may run into a putreſcent ſtate; and whether this caſe may be conſidered as a peculiar ſtate of putreſcency, I dare not determine, but am much diſpoſed to think it not much different from the others; and that, indeed, though different by its cauſes, it is much the ſame with the febrile putreſcency.

HAVING thus aſcertained theſe different ſtates as well as I can, I proceed to give ſome remarks on

PARTICULAR ANTISEPTICS.

SALES ACIDI.

THESE are univerſally antiſeptic, and may be employed in all caſes of putreſcency. The foſſil acids have not been employed in ſcurvy with any advantage; and the reaſon is obvious, as that diſeaſe requires a change in the animal fluid, which we have ſhown above does not admit of an union with theſe foſſil acids. It is therefore that in this diſeaſe the vegetable acids, as capable of ſuch union, are more univerſally proper, and are accordingly employed with certain ſucceſs. In the febrile putreſcency, a foſſil acid, particularly the vitriolic, has been very generally employed; and whether from its concentrated ſtate it has any advantage, I cannot determine: but as it does not unite with the animal fluid, and is even limited in the quantity in which it can be exhibited, I am perſuaded that the vegetable acid, both by the union it can form with the animal fluid, and by the large quantity in which it may be given, will be the moſt effectual.

WHETHER as antiſeptics there is any difference between the native acid of vegetables, and the fermented acid in vinegar, may be a queſtion. I am diſpoſed to think, that in caſes of febrile putreſcency, the latter may be generally uſeful, and perhaps more fit than the former; but in caſes of ſcorbutic putreſcency, I am pretty certain that the native acid, for reaſons already given, will be always the moſt uſeful: but the former, as approaching more to an alimentary matter, muſt be fitter in the caſe of ſcurvy.

SALES ALKALINI.

TUM FIXI TUM VOLATILIS.

EXPERIMENTS out of the body ſhow that theſe alkalines are truly antiſeptic powers; but at the ſame time it is equally well known that they are conſtantly imbued with ſuch an acrimony that they cannot by themſelves be introduced into the body without acting more by their ſtimulant than by their antiſeptic powers. The volatile alkali may ſometimes be an uſeful remedy in putrid fevers; but it cannot, as ſome have imagined, be given more freely on account of its antiſeptic powers, as it can never be given largely enough to have any effect by theſe qualities.

SALES NEUTRI VEL TERRESTRIS.

THESE ſaline matters, by experiments out of the body, are manifeſtly antiſeptic; but how far applicable in caſes of morbid putreſcency, we are very doubtful. As, in my opinion, ſcurvy conſiſts in a preternaturally ſaline ſtate of the blood, ſo I would judge that every addition of ſaline matter muſt be in ſome meaſure hurtful, and therefore that they are not anywiſe admiſſible in this diſeaſe.

IN the caſe of febrile putreſcency, no ſuch objection lies againſt their uſe; and they are commonly employed in fevers, both for their refrigerant and antiſeptic powers. The former purpoſe is often obtained by their operation on the ſtomach; but that their refrigerant power renders them antiſeptic is very doubtful: But however that may be, I am perſuaded that in any quantity in which they can be taken into the body, their antiſeptic powers in the blood-veſſels can never be conſiderable.

An ounce of nitre exhibited in divided doſes in the courſe of twenty-four hours, can have little effect on a fermentation going on in the whole maſs of blood, or in the ſeroſity, conſiſting at leaſt of fifteen pounds of fluid.

Plantarum Partes Acidæ.

This need not have been inſerted after the general title of Acida; but it was not amiſs to point out, that the native acid of vegetables is the antiſeptic that can be employed in the largeſt quantity; and for a reaſon given above, is, I believe, adapted to every ſpecies of ſcurvy.

Olera Acescentia.

As theſe can be introduced largely as an aliment, they are found to be the moſt powerful and effectual antiſeptics that can be employed in ſcurvy.

As I am perſuaded that the moſt certain means of obviating ſcurvy is by filling the blood-veſſels with aceſcent matter, ſo I long ago gave my opinion, that Sugar and Honey much employed in diet might be a means of preventing the diſeaſe; and my opinion on this ſubject gave the firſt hint to Dr Macbride for his propoſing the employment of malt. I am not indeed certain that ſugar, in its purely ſaline ſtate, will ſo readily enter into the compoſition of the animal fluid as a farinaceous matter, which, beſides ſugar, contains a quantity of other alimentary ſubſtance; but I ſtill maintain, that the infuſion of malt, which has been found to be ſo ſalutary, has its virtues chiefly depending upon the ſugar it contains.

Plantæ Siliquosæ et Alliaceæ.

Why I put theſe together will be obvious from what is ſaid of them above. Both theſe orders of plants, by experiments out of the body, ſhow an antiſeptic power, and may be ſuppoſed to have more or leſs of the ſame when taken into the blood; and even upon that footing have their uſe in ſcurvy: but their antiſeptic powers are not conſiderable; and I am of opinion, that in any quantities in which they can be taken in, except it be in ſuch quantity as can be employed as alimentary, and be at the ſame time directed to an aceſcent fermentation, they cannot be conſidered as powerful antiſeptics: and I hold the moſt acrid ſubſtances of the orders mentioned to be eſpecially uſeful in ſcurvy by their promoting the excretions of putreſcent matter by perſpiration and urine.

ASTINGENTIA.

IN experiments out of the body, theſe are found to be powerful antiſeptics; but I do not find that they can be taken into the body in ſuch quantity as to be internally of much ſervice. They have been frequently employed in the caſe of ſcurvy; but their effects have never appeared to be conſiderable: and I am of opinion that they ſhould not occupy the place of more powerful remedies.

AMARA.

I HAVE to ſay much the ſame thing of theſe as I have ſaid of the aſtringentia; and they have never been found very uſeful in obviating or preventing ſcurvy. In caſes, however, of a febrile putreſcency, commonly attended with a conſiderable debility, they may poſſibly, by their tonic powers, have their uſe.

I AM led to this in conſidering the Peruvian bark, which I comprehend under the title of Amara. This bark is well known to practitioners to be highly uſeful in all caſes of febrile putreſcency, when it is employed in ſufficient quantity. Whether however its effects are to be aſcribed to its tonic, or to peculiar antiſeptic powers, I cannot certainly determine; but I am diſpoſed to think that the former opinion is the beſt founded; which, however, need not prevent practitioners, either in the caſe of fever or ſcurvy, from employing its antiſeptic power as far as they may think proper.

THE benefit received from it in ſcurvy has never been remarkable; and I ſhould ſay the ſame thing of it that I ſaid above of aſtringents, that it ſhould never occupy the place of more effectual remedies.

WHETHER, in caſes of fever, any other tonic medicine might be employed in place of the bark, does not ſeem yet to be determined by proper experiments; but it certainly deſerves to be conſidered, when upon occaſion the bark may be wanting.

AROMATICS,

And their eſſential oils, are ſet down here, as being certainly, in experiments out of the body, antiſeptic; but I am of opinion that they cannot, upon account of their ſtimulant and heating power, be admitted as medicines in any caſes of putreſcency, except that in certain caſes of gangrene they may be externally employed.

CAMPHORA.

THE various and ſingular power of this we have taken notice of above; but there are none of its powers more remarkable than its antiſeptic; and though for its uſe in this way it can hardly be given in large quantity, I am clearly of opinion, that in all caſes of putrid fever, where it can be on any account admitted, it ought always, with a view to its antiſeptic power, be employed as largely as poſſible. In caſes of external putreſcency its uſe has often been moſt beneficial.

GUMMI RESINÆ.

I HAVE ſet down theſe in the liſt of antiſeptics, as they prove manifeſtly ſuch in experiments out of the body; but there is the ſame objection to their internal uſe as I made with reſpect to the aromatics. Their ſtimulant cannot be compenſated by their antiſeptic powers.

THEIR external uſe I leave to be judged of by the ſurgeons; but I believe it has been more frequently employed than it ought to have been.

THE other articles of the catalogue of antiſeptics, that is, *Crocus*, *Contrayerva*, *Valerian*, and *Opium*, are all ſet down here upon the ſame footing as the laſt article of Gummi Reſinæ; and that is, from their being found in experiments out of the body to be in ſome meaſure antiſeptic; but none of them are ſo conſiderably or powerfully ſuch as to promiſe being of much uſe in caſes of morbid putreſcency.

VINUM ET LIQUORES FERMENTATI.

AFTER what I have ſaid above of the uſe of acids and aceſcents, I need hardly have inſerted this article; but it cannot be amiſs to repeat, that the plentiful uſe of weak fermented liquors of all kinds are moſt certain means both of obviating and curing ſcurvy.

I HAVE here ſet down ALCOHOL, as certainly one of the moſt powerful antiſeptics known: but as we cannot eaſily diveſt it of its ſtimulant power, it is very doubtful if it ever can be employed as an antiſeptic in caſes of morbid putreſcency.

THERE are, however, caſes of putreſcency attended with very great debility; and whether in ſuch caſes the alcohol properly diluted can be employed in place of wine and bark, may be doubtful; but in caſes where either of theſe are wanting, or cannot be eaſily obtained, I am perſuaded that the diluted alcohol may be uſefully employed.

EVACUANTIA.

HAVING now conſidered the ſeveral medicines which are ſuppoſed to change the ſtate and condition of the fluids, I proceed to conſider thoſe which excite and promote the evacuation of them.

IN this I do not find it neceſſary to conſider evacuations in general, and therefore theſe made by blood-letting, bliſtering, or other ſuch; and am only to conſider theſe evacuations which are produced by exciting and promoting thoſe which nature has inſtituted.

WITH reſpect to theſe I might obſerve, that the evacuation may be produced in two ways; that is, either by medicines which change the ſtate of the fluids, ſo as to fit and diſpoſe them to paſs off more copiouſly by certain ſecretions, or by medicines which internally or externally are applied to excretories, from which we propoſe to excite a more copious excretion.

tion. Theſe different meaſures, however, we do not propoſe to conſider here, as we think it will be more properly done when we are to conſider the ſeveral particular evacuations to be treated of. We proceed then to conſider the particular evacuations and evacuants, arranging them as they occur *a capite ad calcem*; that is, conſidering firſt thoſe made from the ſuperior parts, and afterwards thoſe from the inferior. This arrangement has no particular advantages; but no better offers itſelf at preſent.

I begin therefore with the Errhines.

CHAPTER XVI.

ERRHINA.

THESE are medicines which procure a diſcharge from the noſe, ſometimes of a mucous, and ſometimes of a thinner fluid; but which in both caſes we ſuppoſe to proceed from the mucous follicles of the Schneiderian membrane upon the internal ſurface of the noſe, and of the cavities adjoining to it.

THIS evacuation is ſometimes procured without any ſneezing, but frequently attended with it. This however implies no difference, but merely that of ſtronger or weaker ſtimulus in the medicine employed. The ſneezing that occurs may have particular effects by the concuſſion it occaſions; but it does not vary the evacuation induced by the medicine, excepting that with ſneezing there is commonly a larger evacuation produced.

THIS evacuation often goes no further than to reſtore the natural

tural evacuation when it had been interrupted; but it commonly goes further, and increaſes the evacuation beyond its uſual meaſure; and that not only for ſome time after the medicine has been applied, but alſo for ſome following days.

THIS evacuation not only empties, but alſo produces, a larger excretion from the mucous follicles of the Schneiderian membrane: but, agreeable to the laws of the circulation, this muſt produce an afflux of fluids from the neighbouring veſſels, and in ſome meaſure empty thoſe. By this it often relieves rheumatic congeſtions in the neighbouring muſcles, and particularly thoſe in which the toothach often conſiſts.

BUT not only the more nearly adjoining muſcles are thus relieved, but the effects may extend further to the whole of the branches of the external carotid; and we have known inſtances of headachs, pains of the ear, and ophthalmias, cured or relieved by the uſe of errhines. How far their effects may extend, cannot be exactly determined; but it is probable that they may operate more or leſs on the whole veſſels of the head, as even a branch of the internal carotid paſſes into the noſe: and independent of this, it is not improbable that our errhines may have been of uſe in preventing apoplexy and palſy; which at leaſt is to be attended to ſo far, that whenever any approach to theſe diſeaſes is ſuſpected, the drying up of the mucous diſcharge ſhould be attended to, and, if poſſible, reſtored.

THESE are the effects of an increaſed diſcharge from the noſe: and we are to ſay next how they are to be obtained; which is to be done by ſtimulants applied to the internal ſurface of the noſe; and I have ſet down a liſt of ſuch as may be employed. Theſe differ only by the degree of acrimony they poſſeſs; and I have endeavoured to arrange them accordingly: but I could not poſſibly do this with much accuracy.

BETA.

THIS is of no great power, but I have ſet it down; as from the time of Galen to the preſent it has been marked by many writers as an uſeful errhine: but in my trials, the juice ſnuffed up the noſe gave no large or durable evacuation.

BETONICA. MARJORANA.

THESE by themſelves have not much power as errhines; and I believe the power they have is in common to them with many others of the verticillated plants; and they ſeem to be only uſeful, by diffuſing and giving an agreeable odour to the other errhines.

ASARUM.

THIS is to be conſidered hereafter as an emetic and purgative, and here only as an errhine, in the liſt of which it has been long reckoned; and I truly find it to be one of the moſt uſeful and convenient. In large doſes it is very powerful, and ſometimes too violent; but in more moderate doſes, not exceeding a few grains, and repeated for ſeveral evenings together, it may be employed to procure a pretty large watery diſcharge from the noſe; and which ſometimes continues for ſeveral days together. By this it has the general effects of errhines above mentioned, and particularly has proved very uſeful in toothach and ophthalmias.

IT is properly the baſis of the pulvis ſternutatorius of our colleges; but I judge the London college have added too large a proportion of the cephalic plants, which renders the doſe of the chief ingredient, the aſarum, by much more bulky than convenient; and that the Edinburgh college have given a compoſition much more convenient for a proper exhibition. I find that three grains of aſarum is a proper doſe; and that four grains of the whole powder makes a convenient ſnuff.

NICOTIANA.

THIS, as commonly prepared for perſons who amuſe themſelves by ſnuffing, I find may, with people unaccuſtomed with it, be conveniently enough employed as an errhine. It will be of different force with different perſons; but in a moderate doſe it is never violent with any. Repeated once a-day, it may, like the aſarum, continue a diſcharge for ſome time; but repetition is ready to diminiſh its power, and render it uſeleſs. I obſerved above, that even in people accuſtomed to ſnuffing, it has different effects in producing more or leſs of a diſcharge from the noſe: and from my own experience, I am led to repeat here, that whenever the diſcharge has been conſiderable, the laying aſide ſnuffing, and therefore ſuſpending that diſcharge, may have very bad effects.

EUPHORBIUM.

HERE I enter upon the mention of the more acrid errhines, and I believe the euphorbium is one that is the moſt ſo: but before mentioning the precautions neceſſary in the uſe of it, and ſeveral others that might be added, I muſt obſerve that the more acrid errhines, even in moderate doſes, are ready to inflame the internal ſurface of the noſe, and often to a conſiderable degree; and this is often communicated not only to the immediately adjoining parts, but to the whole branches of the external carotid, ſo that the whole of the teguments of the head are affected with conſiderable ſwelling. Theſe effects, by being at the ſame time attended with hæmorrhagy from the noſe, and violent ſneezings, may have very miſchievous effects; and it is very ſeldom that they ever anſwer any purpoſe of medicine. It is therefore my opinion that they ſhould never be employed in doſes that may have the conſequences mentioned. Whether they are ever to be employed in leſſer doſes I am doubtful. I have ſeen ſome inſtances of megrims, opthalmias, and particularly toothachs, cured by the violent operation of errhines; but I never thought it ſafe to imitate the practice.

IT is poſſible that, employed in very moderate doſes, they may increaſe the power, and render more permanent the effects of the aſarum or of tobacco; and I have ſometimes thought that they anſwered this purpoſe: but it is the white hellebore only that I have employed to the quantity of one grain to half a dram of the ſneezing powder. I have ſometimes tried the euphorbium, but it is liable to be violent even in very ſmall quantities.

THERE is one ſternutatory ſometimes employed by the vulgar of this country, and that is the ſuccus radicis iridis noſtratis; but as the juice is ſnuffed up the noſe, the doſe of it cannot be well meaſured; and I have frequently found the effects of it very violent.

CHAPTER XVII.

SIALAGOGA.

FOR the ſake of comprehending the laſt article, I have thought it neceſſary to employ the general title, while with reſpect to the others I could not diſtinguiſh them as acting more upon the mucous follicles than upon the ſalivary glands. It anſwers our purpoſe very well to diſtinguiſh the ſialagoga as applied externally to the excretories from which the evacuation is to be produced, or as they are applied internally, and operating as ſuppoſed on the ſtate of the fluids to be poured out.

THE medicines externally applied, are, for obvious reaſons, named Maſticatories. They have frequently, and properly enough, been called Apophlegmatizonta; but I did not employ the term, becauſe it comprehends, without diſtinction, both the errhines and external ſialagogues.

THE latter, which I am to ſpeak of now, are certain acrid ſubſtances, which, applied to the internal ſurface of the mouth, ſtimulate the excretories of ſaliva and mucus opening there; or as nature has ordered that upon any acrid matter being applied to the ſenſible parts of the tongue, or internal ſurface of the mouth, that a quantity of ſaliva and mucus ſhould be poured out to waſh it off, or to obviate its effects; ſo by this, as well as by an application to the excretories, an evacuation is produced, and commonly a much larger than can be produced by any application of errhines.

THIS evacuation, however, operates in a manner very analogous to that of the errhines. By their emptying the ſalivary glands and mucous follicles, they produce an afflux of fluids from all the neighbouring veſſels, and which is upon occaſion extended, as we alleged the evacuation of errhines to be, to the whole branches of the external carotid. By this it will be readily underſtood that our maſticatories may relieve rheumatic congeſtions, not only in the neighbouring parts, as in the caſe of toothach, but alſo congeſtions or inflammatory diſpoſition in any part of the ſyſtem of the external carotid.

THE means that may be employed for the purpoſe are many; and indeed every one that can prove acrid or heating to the tongue or internal ſurface of the mouth. I have ſet down a liſt marking the angelica as mild and agreeable; the imperatoria, as one more acrid, or as more acrid ſtill, the pyrethrum, which therefore is commonly employed. I need not proſecute the pointing out and conſidering others; and have only to mention, that I have found none more effectual, though not marked in my liſt, than a bit of freſh horſe-radiſh root held in the mouth, and chewed a little there.

THESE are the external ſialagogues; and I muſt next treat of the internal, of which the only example is the celebrated

HYDRARGYRUS.

THIS I ſhall often ſpeak of under the appellations of Quickſilver and Mercury; but theſe terms are now ſo commonly employed and underſtood that I am in no danger of being miſtaken. I ſhall treat of this medicine as fully as I can, as it is one of the moſt uſeful and univerſal medicines known; and it has indeed, on that account, been the ſubject of much diſcuſſion and writing: but as I judge much of this to be ſuperfluous, I am to endeavour to bring the matter into the moſt conciſe and ſimple view poſſible.

QUICKSILVER in its native, and as we commonly ſpeak, its running ſtate, is, I am perſuaded, a perfectly inert ſubſtance with reſpect to the human body. About ſixty years ago, upon the authority of Dr DOVER, the author of the *Ancient Phyſician's Legacy*, crude quickſilver was brought into frequent, and even into faſhionable uſe; and I knew many inſtances in which it was employed very largely, and for a long time: but upon the moſt fair and ſtrict examination that I could make, it never had any ſenſible effects, or cured any one diſeaſe.

SINCE that time it has hardly ever been employed in practice, except upon the ſuppoſition that by its weight it may overcome ſome ſtrictures or obſtructions in the inteſtinal canal. But the theory of this has been miſtaken; and I have never known, in ſeveral inſtances of its employment, nor have I heard of, any inſtances of its ſucceſs in practice.

To render quickſilver therefore active with reſpect to the human

man body, ſome changes in its chemical ſtate, or ſome additions to its ſubſtance, are found to be neceſſary. What are the various means of rendering it thus active, I ſhall endeavour to aſcertain hereafter: But as I am diſpoſed to judge that the effects of it, in all its active ſtates, however various, are always very much or nearly the ſame, I ſhall begin firſt with conſidering theſe.

UNIVERSALLY mercury in its active ſtate ſeems to be a ſtimulus to every ſenſible and moving fibre of the body to which it is immediately applied; and in conſequence, it is particularly a ſtimulus to every excretory of the ſyſtem to which it is externally or internally applied. Beſides its noted effects upon the excretories of the ſaliva, it ſeems to operate upon the whole of thoſe of the alimentary canal. It proves often diuretic; and I have particular proofs of its reaching and acting upon the organs of perſpiration.

ALTHOUGH it may ſometimes operate more upon certain excretions than upon others, it may be preſumed, that when any tolerable quantity is thrown into the body, it is in part diſtributed over the whole; and therefore its medicinal effect is, that it is the moſt univerſal aperient and deobſtruent known: and to how many caſes of diſeaſe this operation may be applicable, will be ſufficiently obvious.

BUT before going further, I would allege, that the effects we mention of its producing evacuations depend entirely upon the ſtimulus given to the excretories, and not at all to any change produced in the ſtate of the fluids. This indeed is not the common opinion, but I am diſpoſed to maintain my own; as upon many occaſions of mercury thrown into the body very largely, I have found no difference in the appearance of the ſtate of the blood drawn out of the veins. From the ſtimulus given by mercury to the whole ſyſtem, I have always found the blood putting on the ſame appearance that it does in inflammatory diſeaſes; and particularly, I have not obſerved any circumſtance that implies any diminution of its ordinary conſiſtence.

IT has been the common opinion that mercury does diminiſh the conſiſtence of the blood, and very much increaſes its fluidity; but no evidence or proof of this as a fact, that I know of, has been produced: and I believe it has been taken up upon miſtaken facts, and ſupported by a theory which ſeems to me to be without foundation. This theory, however, has been ſo common and ſo univerſal, that I judge it neceſſary for me to ſhow it to be falſe; and I do it upon the following conſiderations.

BESIDES the general objections that I have made above to the doctrine of the attenuantia and incidentia, the particular application of mercury to the purpoſe ſeems to be very ill founded. It has been ſuppoſed that the ſpecific gravity of the particles of mercury might give it more than uſual force in dividing the coherent portions of our fluids: But if it is attended to, that as the particles of all bodies, by being divided, have their ſurfaces ſo much enlarged, in proportion to their quantity of matter, that the reſiſtance to their paſſage through other fluids is ſo much increaſed, that the heavieſt of bodies, gold, can be ſo divided as to be ſuſpended in water; and though we cannot preciſely determine how much the particles of mercury may be divided in its different preparations, yet it may be confidently preſumed, that in all of them they are ſo much divided as to take off entirely the effect of their gravity.

I KNOW that a grain of corroſive ſublimate may be divided in eight ounces of water, ſo that a portion of it may be rendered ſenſible in every drop of that water. There is therefore no probability of mercury acting upon the fluids by its ſpecific gravity. Whether, however, by its chemical qualities, it may not have effects on the ſtate of our fluids, I cannot be ſo poſitive in maintaining; and muſt candidly own that its effects in the ſcurvy ſeem to point out ſome effects of it upon the maſs of blood. But however it may be in this ſpecial caſe, I am perſuaded ſtill from what we have ſaid above, and from many circumſtances we ſhall hereafter mention I conclude, that the chief effects of mercurial medicines are to be aſcribed to their general ſtimulus of the ſyſtem, and eſpecially to their ſtimulating the various excretories of it.

I have obſerved that mercury may, by the circumſtances of the conſtitution, or perhaps by the nature of the preparation employed, be determined to paſs off rather by one excretory than another: but in this there is nothing more remarkable than its very conſtant tendency to paſs off by the ſalivary excretion. It diſcovers this ſo readily, that unleſs diverted by art to another excretion, a very ſmall quantity of it will always take this courſe.

THIS determination gives a problem which has always been conſidered as a principal one in the conſideration of mercury; and the ſolution of it has been variouſly attempted. The ſpecific gravity has been again here employed; and upon the ſuppoſition of its retaining the direct line in which it is impelled, it is ſuppoſed that it will thereby be more certainly determined to the veſſels of the head: but as we do not admit of the effect of the ſpecific gravity, ſo we ſay, that though it were admitted, the application of it here is not founded on a correct anatomy, and that the whole of the reaſoning on this ſubject is manifeſtly frivolous.

I BELIEVE that from every conſideration the mechanical operation of mercury will be readily deſerted; and we muſt ſeek for the ſolution of our problem from chemical conſiderations, which, however, I find to be attended with much difficulty.

THE ſuppoſition of its diſſolving the blood in ſuch a manner as to render it particularly fit and diſpoſed to paſs off more copiouſly by the ſalivary glands, cannot, after what we have ſaid above againſt the diſſolving power in general, be anywiſe admitted; and we muſt ſtill therefore ſeek for another ſolution of our problem. I ſhall here offer a conjecture on the ſubject; but as a conjecture only I allow it to be received.

I SUPPOSE that mercury has a particular diſpoſition to unite with ammoniacal ſalts; and an ammoniacal ſalt increaſing the ſolubility of corroſive ſublimate is to me ſtrongly in proof of this. In illuſtration of it, I would obſerve, that the union of mercury with the ammoniacal ſalt of the ſeroſity, explains well why mercury is ſo much diſpoſed, and more univerſally than any other ſubſtance we know of, to paſs off by the various excretories of the body. At the ſame time, if we can allow, what is very probable, that ammoniacal ſalts paſs off by the ſalivary glands more copiouſly than by any other excretion, we ſhall find a reaſon why mercury, aſſociated with ſuch ammoniacal ſalt, will readily paſs to the ſalivary glands; and being thus applied to their excretories, will produce the ſalivation that ſo readily happens.

I HAVE thus attempted a ſolution of the problem propoſed, but muſt obviate ſome objections that ſeem to ariſe to my doctrine. The fœtor of the breath attending ſalivation is ſuppoſed to ſhow that ſome putrid diſſolution of the fluids has taken place: but however we may account for that fœtor, we muſt ſtill maintain from what we have ſaid above, that there is no ſuch general putreſcency taking place. And I muſt add here, that there is not only no ſymptoms of putreſcency in the other parts of the fluids appearing during the time of the higheſt ſalivation, but that mercury has no tendency to induce any ſuch ſtate appears to me from hence, that when the body has been long and largely drenched with mercury, as ſoon as the irritation of this ceaſes, there is not the ſmalleſt ſymptom of putreſcency, or of any tendency to it, appears in the ſtate of the fluids, which on the contrary immediately appear in their moſt natural and perfect ſtate. The fœtor therefore attending ſalivation muſt be referred to ſome operation upon the ſaliva itſelf; upon which I might perhaps offer a conjecture, but do not incline to offer any more of that kind.

HOWEVER it may be, I think it is probable that the operation of mercury is almoſt entirely in the mouth; and it is proper to obſerve, that the buſineſs commonly proceeds in this manner. The operation of the mercury is always firſt perceived by a diſagreeable taſte in the mouth, which is commonly ſuch as if ſome preparation of copper had been applied to it. This is always attended with ſome degree of redneſs and ſwelling in the gums and other parts of the mouth. As theſe ſymptoms increaſe, the ſaliva flows more copiouſly; and commonly theſe ſymptoms of irritation, and the largeneſs of the ſalivation, are in proportion to one another; ſo that there can be no doubt that the flow of ſaliva depends upon an irritation applied to the excretories of that fluid: and though we ſhould not be able to explain the whole of the phenomena attending it, we have no occaſion to ſeek for any other cauſe of the excretion produced.

AFTER theſe remarks upon the operation of mercury, we are led to ſpeak of its effects in curing diſeaſes: and here nothing more remarkable preſents itſelf than its peculiar power in curing the venereal diſeaſe. How it is peculiarly adapted to this, it is difficult to explain; and the explanation has been attempted in different ways.

SOME ingenious men have thought that mercury is an antidote to the poiſon which occaſions the diſeaſe; and though they have not brought any evidence in proof of this, they have ſhown that other explanations are ſo unſatisfying that we are in a manner obliged to have recourſe to this; and I have lately met with ſome facts that are very favourable to the ſuppoſition. A phyſician took a quantity of matter from a venereal chancre, and mixing it with a quantity of PLENCK's gummy ſolution of mercury, he applied this mixture to a ſound perſon, but could not find that it produced either a chancre or any other ſyphilitic ſymptom. This may ſeem to afford ſome concluſion; but as I am not acquainted with the circumſtances of the experiment, nor have any account of its being repeated with attention, I cannot admit of any concluſion from it; both becauſe it is very poſſible that the gummy ſolution might render the mercury inert, without making any change in the nature of it, and becauſe it is ſtill liable to all the objections that can be made to the operation of an antidote.

WITH reſpect to this, not to mention the difficulties which occur in explaining the application of the antidote to the poiſon,

ſon, I think it neceſſary only to offer one conſideration; which is, that if mercury be an antidote to the venereal poiſon, the cure of the diſeaſe ſhould be always more or leſs readily finiſhed, according to the quantity of mercury thrown into the body: and conſidering how univerſally the poiſon is diffuſed, it ſhould ſeem that a pretty large quantity of mercury ſhould always be neceſſary; but practitioners will hardly allow that either of theſe circumſtances conſtantly take place; and we maintain that the moſt active preparations are moſt ſpeedy in curing the diſeaſe.

WHETHER corroſive ſublimate be always the moſt proper remedy may be doubtful; but we maintain, that in many inſtances it cures the diſeaſe by a ſmaller quantity of mercury than can be done by any other preparation, though the latter introduces the mercury in much larger proportion. This to me renders it very probable, and almoſt certain, that mercury does not cure the diſeaſe by being an antidote to the poiſon, but in ſome other way, whether we can explain this or not.

THE moſt ſpecious argument in favour of mercury's being an antidote, is its being applied to parts of the body in which the venereal poiſon is accumulated more largely, and its proving readily a cure of the local diſeaſe. This appears eſpecially in the caſe of chancres, which are readily cured by the immediate application of mercury to them: but this does not afford a concluſion; for mercury in like manner cures many ulcerations in which no venereal poiſon is ſuſpected. And if any body ſhould imagine that mercury cures thoſe ulcerations by its being an antidote to the poiſon they contain, ſuch an imagination muſt be corrected, when it is conſidered that balſams, and more certainly copper, will anſwer the purpoſe of curing thoſe ulcerations as well as mercury. The cure of chancres therefore, by the application of mercury, does not neceſſarily infer its power as an antidote; nor do I know any other arguments that can be adduced in favour of ſuch an opinion.

It was however obſerved above, that the chief reaſon for ſuppoſing that mercury cured by being an antidote, was, that no other good explanation was given how it otherwiſe cured the diſeaſe. But it is incumbent on us to obviate a concluſion we do not admit of; and therefore, that we ſhould attempt a difficult problem, which is, to explain here in what manner mercury does cure the venereal diſeaſe. We are well perſuaded that it does it by increaſing the excretions, by which the poiſon is thrown out of the body. In ſupport of this opinion we obſerve, that we have not known any inſtance of the diſeaſe being cured without an excretion taking place. It ſeems commonly to be eſpecially by the mouth; but we always obſerve, that this excretion is attended with ſome degree of inflammation of the mouth; and commonly it is ſo much as to affect the whole ſyſtem, ſo as to induce in it a phlogiſtic diatheſis. This mark of mercury's ſtimulating the whole ſyſtem, with what was ſaid above of its affecting the whole excretories, will ſufficiently ſhow, that in its ordinary operation, by its promoting all the excretions, it may thereby evacuate every poiſon that ſhall happen to be preſent in the maſs of blood, and may thereby entirely cure the venereal diſeaſe. We have ſaid that its chief and moſt evident operation ſeems to be in the mouth; but I hold this to be neceſſary only to ſhow, that mercury, in an active ſtate, has been introduced into the body: and it does not neceſſarily imply that the venereal poiſon paſſes out of the body more readily by the excretories of the ſaliva than by any other courſe; for when a ſalivation is excited, there is at the ſame time marks of the other excretions being excited: and practitioners now know very well, that by a longer continuance of the other excretions, the diſeaſe may be cured without ſalivation; and if there are inſtances of ſalivavation's being more effectual than any other meaſure, it may imply no more than that, in certain caſes, a larger quantity of evacuation is neceſſary than in certain others.

That ſalivation alone is often not ſufficient, I have this proof.—In a venereal patient, a ſmall quantity of mercury very ſuddenly excited a copious ſalivation, and which continued to be very copious for many days after. By this the ſymptoms were in ſome meaſure relieved; but ſoon after the ſalivation ceaſed, and mercury was not farther exhibited, but the ſymptoms returned with as much violence as they had ſhown before; and it was only by a nice management that mercury, exhibited and employed for a long time, entirely cured the diſeaſe. I have had alſo ſeveral inſtances, in the uſe of mercury, when ſalivation happened to ariſe and continue for ſome time, without the cure being advanced in proportion to thoſe fits of ſalivation. It is my opinion, that it is the due continuance of the excretions being increaſed that affords the moſt certain cure of the diſeaſe. This leads to conſider the queſtion, If the diſeaſe is to be cured by evacuation, why other evacuations, however diligently employed, does not cure the diſeaſe as well as thoſe by mercury? The anſwer to this may be, that all other evacuations are partial only: they may largely diminiſh the quantity of the fluids, but they draw them off by one way only, and without being attended with any general increaſe of excretion. They for the moſt part diminiſh all the excretions except that which is on the occaſion, by ſpecial means, increaſed; and it is mercury only that, under proper management, can be employed to increaſe the whole excretions at the ſame time. It ſeems to be by this peculiar mode of operation that it is peculiarly fitted to cure the venereal diſeaſe.

WHEN I have thus ſpoken of the various operations and effects of mercury, it remains to ſay how theſe operations are modified by the various preparations of it which have been propoſed and employed.

WE have ſaid already, that quickſilver, in its native running ſtate, is abſolutely inert with reſpect to the human body; and to render it active for the various purpoſes we have mentioned, it muſt be chemically changed. The changes propoſed have been many and various; but in my opinion they may all of them be referred to four heads, as the mercury may be changed, 1*ſt*, By being converted into vapour: 2*dly*, By calcination: 3*dly*, By triture with viſcid fluids; and, 4*thly*, By being combined with acids of different kinds.

THESE various preparations have now been explained and detailed, either in many books of chemiſtry and pharmacy, or in writings on the venereal diſeaſe, that it does not ſeem neceſſary for me to give any particular account of them here. Whoever would conſider them more particularly, will find the moſt ample detail in Dr SWEDIAUR's Pharmacopæia Syphilitica, at the end of his Practical Obſervations on *Venereal Complaints;* and I ſhall diſmiſs the ſubject here with a very few remarks.

THE employment of mercury in vapour may perhaps be the beſt adapted to ſome local complaints; but its application to the whole body is attended with ſo much hazard and uncertainty in the adminiſtration as hardly ever to be an eligible practice.

The preparation by calcination is not, as had been formerly ſuppoſed, of any peculiar power or advantage, and is therefore, I believe, little employed in the preſent practice: juſtly, as I judge, becauſe the calcination ſeems to have no other effect than putting the mercury in a condition to be acted upon by the acids of the ſtomach, and therefore that this preparation does not differ from thoſe made by a combination with acids.

THE preparations by triture ſeem to be milder than thoſe formed by a combination with acids; but from the incomplete triture that happens often to be given, they render the practitioner often uncertain in their uſe. The triture with unguinous ſubſtances gives the advantage of its being introduced by unction upon the ſkin; and when it has been properly prepared, and is properly adminiſtered, it gives a manner of introducing mercury which is often leſs liable to purging, and therefore more convenient than the employment of the ſaline preparations.

THE ſaline preparations are different according to the acid employed. Thoſe made by the vegetable acid are milder, and more manageable, than thoſe formed with any of the foſſil acids. Of theſe, the combination with the muriatic acid, when the acid is in its full proportion to the mercury, as it is in the corroſive ſublimate, is certainly more active and powerful than any other ſaline preparation. The uſe of it has been often convenient and effectual; but its operation is ſo different in men of different conſtitutions, that the employment of it often requires a good deal of management and diſcretion.

IT is rendered much milder in the preparation of the mercurius dulcis, which has given occaſion to this being ſo frequently employed, but it does not ſeem to me to be a very eligible preparation. It does not ſeem to be ſo readily diffuſible in the ſyſtem as many others, and that becauſe it is more ready than many others to operate upon the inteſtines, and run off by ſtool. This may give it ſome advantages for its being combined with purgatives; but for that very reaſon it is leſs fit for being employed to act upon the ſalivary glands, or upon the other excretions of the ſyſtem.

To conclude the ſubject of the medicinal powers of mercury, it will readily appear, that whoever conſiders the general deobſtruent powers mentioned above, and at the ſame time the various effects of it when employed as a purgative, will fully apprehend its very extenſive uſe in the practice of phyſic.

CHAPTER XVIII.

EXPECTORANTIA.

THESE are medicines which facilitate the bringing up the contents of the cavity of the lungs. This however muſt always be done by more or leſs of coughing; but as we do not know, or at leaſt that I do not know, of any internal medicines for exciting this, I have confined my definition of expectorants to be thoſe which render the contents of the bronchia to be more eaſily brought up. For the external means that may excite coughing, the ancient Cnidians practiſed ſuch; but whether our modern practitioners will follow their example, I muſt leave to a further time to determine.

THE rendering the matters for the time preſent in the bronchia more or leſs ready to be brought up, muſt depend upon the nature and ſtate of theſe matters; but as theſe may be very various according to the difference of the diſeaſe that has poured them out, ſo we cannot here give any general rule; and it appears to me, that in moſt caſes we can neither increaſe their quantity, or otherwiſe change them ſo as to render them fit for being more readily brought up.

THE caſe moſt frequently occurring, and which we underſtand the beſt, is when the mucus which naturally exudes, or is poured out from the follicles of the bronchia, is poured out in unuſually larger quantity, and often in a more viſcid ſtate than can be eaſily detached from the cells of the bronchia.

IT is in this caſe eſpecially that expectorants are required; and it is ſuppoſed that by their uſe the mucus may be brought up more largely and with more facility. In what manner however they do this, I find it difficult to explain. They might perhaps do it by merely exciting coughing; but, as ſaid already, I know of no internal medicines capable of doing this: and I muſt here mention by the way, that I know of no means of exciting cough with expectoration but by employing vomiting. It may alſo be obſerved by the way, that the diſeaſes depending upon an accumulation of mucus in the lungs may be often relieved by medicines which determine to the ſurface of the body, which may diminiſh the determination to the lungs; and by diminiſhing the quantity of mucus poured into the bronchia, the expectoration of what remains may be rendered more eaſy.

THESE means, however, do not properly touch the buſineſs of expectoration; and it is commonly and juſtly ſuppoſed, that the effectual means of expeding this, is by rendering the mucus leſs viſcid, and upon this account more eaſily detached from the bronchia.

HERE therefore it is very univerſally ſuppoſed, by practical phyſicians as well as by writers on the Materia Medica, that there is place for the medicines named and ſuppoſed to be *Attenuantia et Incidentia;* but I ſuſpect that the whole of the theory on this ſubject is incorrect and miſtaken. I am ſtill perſuaded, by the arguments employed above, that in general no ſuch medicines do exiſt; and I am clear that thoſe arguments apply as ſtrongly here as in any other caſe.

BUT another and a ſpecial conſideration occurs with reſpect to the preſent ſubject; as we maintain, not only that attenuants do not operate, but that there is here no ſubject for them to operate upon. In ſpite of all that Mr SENAC has ſaid of the exiſtence of a mucus in the maſs of blood, neither he nor any one elſe has brought any evidence of ſuch a matter exiſting in the circulating maſs of our fluids; and it is probable to me that a mucus never appears but in conſequence of a ſtagnation in mucous follicles. Many phænomena ſhow, that whenever the ſecretion of the liquor to be changed into mucus is increaſed, it is poured out in a very liquid form; and therefore, from its appearance afterwards as a mucus, there is no concluſion to be drawn that any ſuch viſcid fluid exiſted in the maſs of blood. We hold it therefore for certain, that in the diſeaſes depending upon an accumulation of mucus in the bronchia, there is no place for the operation of attenuants, as I believe that nobody will fancy they can operate upon the mucus already poured out into the bronchia.

THE common theory of expectoration, therefore, ſeems to be unſatisfying; and the explaining of it in any other way appears to be difficult. The only explanation that I can find probable is, that by increaſing the ſecretion of the liquid that is to afford a mucus, this, as poured from the arteries into the follicles, being always a thin fluid, it may dilute the mucus in the follicles, and may make it to be poured out from theſe in a leſs viſcid ſtate, and may thereby render it more eaſy to be brought up by coughing, that is, to be more freely expectorated.

THE means however of increaſing this ſecretion may not be very obvious. We know no internal medicine that ſeems to increaſe the ſecretion of mucus from the Schneiderian membrane; and whether there are any medicines that can expede the ſecretion of the ſame from the bronchia may be doubtful; but I find it probable that there are truly ſuch.

WE know now that there is a conſtant and conſiderable exhalation of moiſture from the cavity of the lungs; and there are many reaſons for believing that this is an excrementitious ſecretion connected with the other excrementitious ſecretions, particularly with the perſpiration from the ſurface of the body.

IF therefore there are medicines diſpoſed to paſs by perſpiration, it may be preſumed that the ſame are diſpoſed to paſs by the exhalation from the lungs. And here therefore is a view of medicines, which, paſſing through the veſſels of the lungs, may poſſibly operate upon the ſecretions made there, and particularly the principal one made there, the ſecretion of the fluid to be changed into mucus. By this, as we have ſaid above, the mucus preſent in the follicles may be poured out in a leſs viſcid form, and conſequently in a ſtate to be more eaſily brought up by expectoration.

THIS is the theory of expectorants which we can offer; but how it will apply to explain the operation of particular medicines, I ſhall leave my readers to determine.

PARTICULAR EXPECTORANTS.

IN this liſt I have firſt ſet down a number of the verticillated plants which have had ſome reputation as expectorants. I have treated of them before in their proper place, and have even there mentioned their ſuppoſed expectorant powers; but have ſaid alſo, that theſe powers have not at all been confirmed by my experience.

ENULA CAMPANA.

THIS, both by its ſenſible and chemical qualities, promiſes to be a medicine of ſome power, and it has commonly been ſuppoſed to be ſo; but after many trials of it I am at a loſs to determine what are its peculiar virtues. I have frequently tried it as an expectorant, but never with any evident ſucceſs. It has been ſuppoſed to determine to the uterus; but in the large uſe of it, we have never met with any ſymptoms of its having ſuch a power.

IRIS FLORENTINA.

WHAT this might do in its more recent and acrid ſtate, I cannot determine; but in the dried ſtate in which we commonly have it in our ſhops, we are perſuaded of its being a very inſignificant expectorant.

TUSSILAGO.

THIS is a plant, whether we take it in its leaf or flower, of very little ſenſible quality, and we are afraid of as little virtue.

We have very often employed it; but have never found it evidently to be either demulcent or expectorant. There is, however, one virtue of it which I muſt mention. Upon the teſtimony and recommendation of FULLER, author of the *Medicina Gymnaſtica*, I have employed it in ſcrophulous caſes, and in ſeveral of theſe with ſeeming ſucceſs. The expreſſed juice of the freſh leaves taken to ſome ounces every day, has in ſeveral inſtances occaſioned the healing up of ſcrophulous ſores; and even a ſtrong decoction of the dried leaves, employed as FULLER propoſes, have ſeemed to anſwer the ſame purpoſe. We muſt own, however, that ſuch decoctions have often failed, and that even in ſome trials the expreſſed juice was not ſufficiently effectual.

PETASITES.

THIS is a ſpecies of the ſame genus, but of ſtronger ſenſible qualities, whereby it might be ſuppoſed to have more virtues; and it is agreed that it is more active than the tuſſilago farfara: but how that activity is to be directed I cannot perceive, either from writers or my own experience. This gives me however an opportunity of obſerving, as I have done before, that I conceive all ſuppoſed alexipharmic virtues, ſuch as are aſcribed to the petaſites, to be imaginary and very ill founded.

WE have now mentioned, in complaiſance to the writers on the materia medica, a number of ſuppoſed expectorants, which we cannot find either ſuited to the purpoſe, or in our experience actually uſeful; but there are two medicines ſet down in my liſt of expectorants which I am perſuaded may be really uſeful as ſuch, as they are medicines which manifeſtly ſtimulate the excretories which they any where reach. Theſe medicines are the Nicotiana and Scilla: the former we have treated of already,

ready, and the latter we ſhall have occaſion hereafter to mention, as emetic, purgative, and diuretic: and as, in theſe operations, it gives unqueſtionable marks of its power in ſtimulating excretories, ſo we ſhall be more readily allowed to conſider it, as what it has been commonly ſuppoſed to be, a powerful expectorant. With reſpect to its employment as ſuch, it is hardly neceſſary to obſerve, that it muſt be given in ſuch ſmall doſes as may not occaſion its acting upon the ſtomach or inteſtines, as the one would prevent its being frequently repeated, and the other would prevent its paſſing into the maſs of blood, where its action as an expectorant can only take place. Its acting as a diuretic is always a mark of its having entered the maſs of blood; and it is my opinion that it is not to be expected to act as an expectorant but when it appears alſo to act upon the kidneys.

WITH reſpect to its pharmaceutical treatment, I muſt obſerve that it is never properly employed in its freſh ſtate, as in that condition it ſo readily affects the ſtomach as to prevent its being given in due quantity; and therefore it cannot be ſo well directed to its other operations. I would therefore have it almoſt always employed in its dried ſtate, when that is properly executed, and the powder is afterwards not long kept. In this ſtate it may either be employed, as we ſpeak, in ſubſtance, or it may be extracted by different menſtruums: and I mention this only to obſerve, that we cannot find any advantage in extracting it by vinegar; which is the leſs proper, as, in ſpite of almoſt every precaution, vinegar will be in different conditions. We maintain that, in every reſpect, wine will be a more proper and certain menſtruum, eſpecially when the ſame quantity of ardent ſpirits is added as in the acetum of the London College. In that of the Edinburgh Diſpenſatory, I cannot find the management of the ardent ſpirit ſo properly managed, as I find that the addition of a quantity of brandy, either with vinegar or wine, would not be unfavourable to the extraction of the ſquills.

At the end of my liſt of expectorants, I have ſet down ſome medicines which have been ſuppoſed to be expectorants: but having treated of each of them before, and having given my opinion with reſpect to their uſe in the affections of the lungs, which comprehends the buſineſs of expectoration; ſo I cannot think it neceſſary to repeat any part of it here.

CHAPTER XIX.

EMETICA.

THESE are medicines which excite vomiting, and thereby bring up and throw out the contents of the ſtomach for the time preſent in it. As, upon other ſubjects, ſo I ſhall here, firſt mention what may be the effects in general or in particular, and afterwards ſay by what means theſe are to be obtained.

ALTHOUGH the contents of the ſtomach may be ſuppoſed no-wiſe morbid or noxious, ſome phyſicians have been of opinion, that the action of vomiting, and the evacuation of the ſtomach, may be uſeful to health; and I am ready to believe, that the moderate practice of this may be uſeful, both by its exciting the activity of the ſtomach itſelf, and by agitating, as vomiting does, the whole body: but I am certain that the practice ought not to be frequent; and I have known inſtances of the frequency of it being hurtful, by rendering the ſtomach leſs fit to retain what is thrown into it, and even to weaken its powers of digeſtion.

When, however, the contents of the ſtomach may be ſuppoſed to be in a morbid ſtate, and noxious to the ſtomach itſelf, or to the whole ſyſtem, there can be no queſtion or doubt about the propriety of vomiting, except in a few caſes, when the action of vomiting may be hurtful to certain conditions of other parts of the body, or when the vomiting cannot be excited but with ſuch ſtraining as may be hurtful to the parts eſpecially concerned in the action, and likewiſe to other parts of the ſyſtem.

When ſuch exceptions do not preſent themſelves, it will always be proper to excite vomiting, not only for throwing out the matters as noxious, but frequently alſo as being ferments to the aliments that are to be afterwards taken in.

The marks of the matter's being noxious by its quality or quantity, are eſpecially the want of the uſual appetite; and often not only a want of appetite, but a loathing of food; or, when aliments are taken in, an uneaſineſs in the time of their digeſtion, and marks of its imperfect condition, ſuch as heartburn, flatulent and acid eructations; and to theſe may be added frequent headachs.

These are the marks of noxious matters preſent in the ſtomach. They indicate the uſe of vomiting and the evacuation of the preſent contents of the ſtomach, which gives generally more or leſs of relief; but it is very neceſſary to be marked, that this relief is ſeldom very durable, as the noxious matters are more frequently to be conſidered as effects than as cauſes. The production of them very commonly depends upon a loſs of tone in the muſcular fibres of the ſtomach, which is not to be cured by vomiting, though the effects of it may be relieved by this for a longer or ſhorter time. They are however unhappy who truſt to this mode of relief, and have therefore frequent recourſe to it; for I am certain, from much experience, that frequent vomiting hurts the tone of the ſtomach, and often makes the ſymptoms of indigeſtion recur more frequently and ſooner than they otherwiſe would have done.

UPON this ſubject I judge it proper to remark, that the effects of vomiting, and the degree of diſeaſe that required it, are commonly judged of, both by the vulgar, and even by phyſicians, though not always fairly, by the appearance of the matter thrown up. For example, there is commonly thrown up a conſiderable quantity of very viſcid mucus; and to this the ſymptoms of the diſeaſe are frequently imputed.

IT is indeed poſſible that an unuſual accumulation of mucus in the ſtomach may be the cauſe of the want of appetite and other ſymptoms of indigeſtion, but not always ſo juſtly as might be imagined. The mucous follicles of the ſtomach conſtantly pour out a conſiderable quantity of this matter; a conſiderable quantity of it is to be found in the ſtomachs of the moſt healthy perſons: and the experiments of Mr SENAC ſhow, that there is always a conſiderable quantity of it in the mucous follicles, which may very readily be ſqueezed out very copiouſly in vomiting. It is not therefore to be judged that the quantity, and even a large quantity, thrown up by vomiting, had either previouſly exiſted in the cavity of the ſtomach, or that ſuch a mucus had been the cauſe of the morbid ſymptoms, indicating therefore the repetition of vomiting. It has been upon occaſions of this practice that I have known repeated vomiting not only to give no durable relief, but rather to increaſe the ſuppoſed cauſe.

THE effects of emetics and of vomiting firſt to be mentioned, are thoſe of evacuating the ſtomach itſelf: but it is now to be remarked that the evacuation goes further; and the duodenum, with a portion of the jejunum, may be, and commonly is, evacuated at the ſame time. The periſtaltic motion of the alimentary canal may proceed downwards or upwards; and when any portion of it acting is, by any circumſtance, directed in one way, the next adjoining portion follows the ſame direction. From this, in vomiting, as the periſtaltic motion of the ſtomach is directed upwards, ſo the motion of the duodendum is directed in the ſame manner, and pours its contents into the ſtomach; from which it will appear, that in vomiting, a conſiderable portion of the upper part of the inteſtines may be evacuated, as we have alleged.

THE moſt clear proof of the inverted motion of the duodenum is, that in vomiting, and eſpecially after repeated vomiting, a quantity of bile ſeems to be poured from the duodenum into the ſtomach, and is in conſequence thrown out by the mouth. This frequent appearance may depend entirely upon the quantity of bile for the time preſent in the duodenum, but it probably extends farther. When, in conſequence of digeſtion, alimentary matters paſs into the duodenum, as it may be ſuppoſed that Nature intends the gall-bladder and biliary ducts ſhould then pour their fluids more copiouſly into the duodenum; ſo it may be ſuppoſed, on this occaſion, that bile is poured more copiouſly into the duodenum, and, in conſequence of the inverted motion, more copiouſly into the ſtomach, from whence it may appear more copiouſly in what is thrown up by vomiting. If this ſhould not be thought ſufficient to account for a quantity of bile being frequently thrown up by vomiting, there is another cauſe, perhaps one more powerful, to be alleged. In the action of vomiting, as the contraction of the diaphragm and of the abdominal muſcles concurs at the ſame time, the whole viſcera of the abdomen are ſtrongly preſſed: this preſſure muſt affect the gall-bladder and biliary ducts, and occaſion them to pour out their contents very largely; and thereby eſpecially a large portion of bile may be thrown up by vomiting.

ON this ſubject I muſt remark, that both the vulgar, and even phyſicians, have been ready to ſuppoſe, that the bile thrown up by vomiting exiſted previouſly in the ſtomach itſelf, and in ſome inſtances it may have been ſo; but it is more probable that it has been brought from the duodenum, and even from the gall-bladder and biliary ducts, in the manner we have explained. There is this particular reaſon for ſuppoſing it, that if the bile had been previouſly lodged in the ſtomach itſelf, it might have appeared in the firſt vomitings as well as in the laſt: but it happens in moſt inſtances that the bile is thrown out by the mouth only after repeated vomitings, and often after repeated ſtrainings in the organs employed in vomiting.

AFTER the evacuation of the ſtomach, the next effect of vomiting to be marked, is this evacuation of bile, in conſequence of the mechaniſm we have explained; and of what importance this may be in many diſeaſes will be ſufficiently obvious. That the ſtagnations ready to happen in the ſyſtem of the vena portarum often lay the foundation of the moſt obſtinate diſeaſes, is well known; and therefore, the obviating theſe by frequent vomiting is likely to be of much importance to the health of the ſyſtem: and indeed I know no means of expeding the circulation in the liver ſo powerful as that of vomiting.

AN effect of vomiting, which, as it may be conſiderable, deſerves to be taken notice of, is, the compreſſion which we have mentioned to be given to the liver, muſt at the ſame time be given to the whole viſcera of the abdomen; by which the motion of the blood in their veſſels, and the whole of the ſecretions and excretions in every part of them, may be promoted, and thereby diſeaſes both prevented and cured.

THESE effects, however, in the abdominal viſcera, are not often remarkable; but the effects of the ſame motions in the thoracic viſcera are often evident and conſiderable. The ſimultaneous contractions of the diaphragm and abdominal muſcles, and the alternate relaxations of theſe organs of reſpiration, muſt variouſly agitate the motion of the air in the bronchia, and thereby expectoration be moſt effectually promoted. Both by this, and the agitation of the blood-veſſels, it will be obvious that vomiting may be often uſeful, as we commonly find it to be, in all catarrhal affections. That it may be alſo uſeful in many caſes of phthiſis pulmonalis we readily allow; but that frequent vomiting may cure this diſeaſe, we cannot, either from theory or experience, find any reaſons to believe.

BESIDES theſe operations on the trunk of the body, vomiting excites the force of the circulation in every part of the ſyſtem, and may thereby be of much uſe; but as ſuch increaſed circulation is not durable, and that it commonly becomes languid in proportion to its former increaſe, ſo it may be juſtly doubted if the general ſtimulus can be commonly of much ſervice. But although the general action of full vomiting may not be conſiderable, yet as directed and operating in particular parts, it may become of great uſe. Thus we are of opinion, that there is a ſpecial conſent between the ſtomach and the veſſels on the ſurface of the body, ſo that the ſeveral ſtates of theſe are mutually communicated to one another; whence the action of vomiting excites particularly the action of the veſſels on the ſurface of the body, and may thereby be of uſe in reſtoring the tone, and overcoming the ſpaſm of the extreme veſſels which take place in fevers.

IT is here, however, to be remarked, that as the effects of full vomiting cannot be durable, nor its operation be conveniently repeated, ſo full vomiting cannot always be employed to prevent the recurrence of the atony and ſpaſm mentioned. But as emetics, though employed in doſes not ſufficient to excite full vomiting, may ſtill excite a degree of action in the ſtomach, and be communicated to the extreme veſſels, ſo as in ſome meaſure to reſtore their tone, and overcome the ſpaſm affecting them, they may thus be uſeful in fevers; and as their operation may be rendered more durable than full vomitings, theſe nauſeating doſes may be ſtill more uſeful. Upon this is founded the preſent practice in employing emetics in the cure of fevers; But as I have explained all this more fully in my *Firſt Lines*, it is not neceſſary to inſiſt farther upon it here.

THERE is an operation of emetics further to be mentioned, which in my opinion depends upon their power of determining to the ſurface of the body; for to this I refer their uſe in aſthma, ſo much recommended by Dr AIKENSIDE. I cannot indeed ſay that I have imitated his practice with much ſucceſs; for in many caſes of ſpaſmodic aſthma, I have continued the uſe of emetics for a long time, without finding that I either prevented the recurrence of fits, or rendered them more moderate when they came; but in ſome other caſes I have found the emetics of benefit in both reſpects; which however happened eſpecially when the aſthma was in any degree of the pituitous or catarrhal kind, and therefore the emetics were of more ſervice in the winter than in the ſummer aſthma.

Of the effects of vomiting and of emetics, ſo far as I can judge, it remains only to take notice of their employment in hæmorrhagy, which to me preſents a difficult problem.

Dr Brian Robinson, lately of Dublin, has recommended frequent vomiting in hæmoptyſis, and has aſſured us of its good effects in ſeveral caſes. Upon the recommendation of ſo good authority, I tried this remedy in ſeveral caſes, and in ſeveral I found it might be employed with ſafety and advantage: But in one caſe the vomiting increaſed the hæmorrhagy to a great and dangerous degree; and the poſſibility of ſuch an accident again happening, has prevented all my further trials of ſuch a remedy.

I can however conceive, that the remedy may be ſafely employed in many caſes, and that really it had, in thoſe in which it was employed by Dr Robinson, been of advantage, by taking off the determination of the blood to the lungs; as I had in more than one inſtance found, that the exerciſe of a carriage employed to a conſiderable degree for ſeveral days together took off entirely a hæmoptyſis, which readily returned upon the perſon's remaining for a day or two at reſt.

It is thus that I would explain the effects of vomiting in a hæmoptyſis. But this was not the theory of Dr Robinson: He ſeems to have been of opinion, that during the ſickneſs that introduces vomiting, there is a conſtriction formed upon the extreme veſſels every where; and that by this conſtriction the hæmoptyſis was ſuppreſſed. Of the juſtneſs of this theory I leave my ſpeculative readers to judge; but what I muſt add ſeems to be in confirmation of it. It has been found, and I myſelf in ſome inſtances have found, that nauſeating doſes of emetics have been of ſervice in ſeveral inſtances of uterine hæmorrhagies; and materia medica writers have commonly alleged, that ſmall doſes of emetics have been employed in many different caſes of hæmorrhagy with great advantage.

HAVING now mentioned pretty fully the effects of vomiting and of emetics, I am next to conſider the ſeveral means which may be employed for obtaining theſe.

VOMITING may be excited by very various means; of which however many of them cannot be employed in practice, and are therefore not to be taken notice of here. Among the means that may be employed, the firſt I would mention, as very generally employed, is filling the ſtomach ſuddenly with a large quantity of liquid; and it is found that almoſt any kind of liquid in large quantity will have the effect: but that the vomiting depends not on the quality but on the quantity of liquid, appears clearly from hence, that warm water of the moſt pure and ſimple kind is generally ſufficient for the purpoſe.

THE theory of this frequent operation has not, in my opinion, been well explained; and it ſeems therefore allowable for me to attempt to do it here.

As, when meats or drinks are taken into the ſtomach, it is neceſſary that they ſhould be retained there for ſome time, till they ſhall have undergone certain changes, by operations to be made upon them in the ſtomach; and therefore, that they may not paſs off too ſoon by the lower orifice, nature has provided, that on every diſtention of the ſtomach, the pylorus ſhould be raiſed up by the longitudinal fibres, which in the ſmall curvature of the ſtomach paſs between its two orifices, and at the ſame time be contracted by the muſcular fibres placed in the duplicate of the coats of the ſtomach formed near to the pylorus. This conſtriction in ordinary caſes is moderate; but we know it can be ſo ſtrong as to ſhut up that orifice entirely: and it is probable that this, as ſeems neceſſary, ſhould always happen in vomiting. It is alſo probable that this contributes to occaſion the vomiting, as this conſtriction of the pylorus muſt invert the periſtaltic motion of the ſtomach, and direct it entirely upwards, and even to a vomiting. If it can therefore be ſuppoſed, as I think it may, that the ſudden diſtention of the ſtomach, by a large draught of warm water, can induce a ſtrong contraction of the pylorus, we ſhall readily underſtand how it produces vomiting, and at leaſt contributes to promote it.

HAVING thus attempted to explain the operation of warm water, which is very much confirmed by what was obſerved above of the effects of a large bulk of liquid thrown ſuddenly into the ſtomach, we proceed to ſpeak of ſome applications of it in practice.

THE effect we have ſaid may be produced by warm water alone; but more readily ſtill, when at the ſame time an emetic medicine is applied to the ſtomach. Theſe emetics we ſhall ſpeak of preſently; but now it is only neceſſary to remark, that in many caſes, when it may not be proper to give the emetic in ſuch a doſe as of itſelf might be ſufficient to excite vomiting, by the aſſiſtance of filling the ſtomach with warm water, ſmall doſes of emetics may ſerve the purpoſe of evacuating the ſtomach, and even of obtaining other effects, which we have ſaid may be produced by vomiting. This ſhows ſufficiently the power and operation of warm water employed in the manner we have ſaid: and it is particularly in illuſtration of the ſame that ſeveral ſubſtances of little power in ſtimulating the ſtomach, are, however, by the aſſiſtance mentioned, employed to excite vomiting, ſuch as the infuſions of a bitter herb, as chamomile or carduus benedictus.

ON the ſame footing it is that certain ſubſtances which ſtimulate the ſtomach more powerfully, but which, on account of their inflammatory nature, cannot be ſafely given in ſuch quantity as by themſelves to excite vomiting, may, by the aſſiſtance of warm water, and by that only, can be employed as very ſafe and uſeful emetics. Such are an infuſion of the root of horſe-radiſh, or a tea-ſpoonful of muſtard as prepared for the table: Theſe are emetics that can hardly be rendered effectual, or be employed, but by the aſſiſtance of warm water. With that aſſiſtance, however, they afford a gentle and uſeful means of exciting vomiting.

BUT we muſt now ſpeak of thoſe ſubſtances which of themſelves, when introduced into the ſtomach, can excite this action of it.

OF theſe I have, according to my general plan, ſet down, in the firſt place, thoſe taken from the foſſil kingdom; but from ſeveral conſiderations I find it proper to begin with treating of thoſe taken from vegetables.

ASARUM.

THIS, in ancient times, was frequently employed; but ſince phyſicians became acquainted with antimonial emetics, it has been very little in uſe; though we can ſay, from our own experience, that it is ſufficiently fit for the purpoſe. The root dried only ſo much as to be powdered, proves, in a moderate doſe, a gentle emetic. It will commonly anſwer in doſes of a ſcruple, ſometimes in a leſs quantity; and though given as ſome authors have propoſed, in larger doſes, it may be ſafe; as commonly a quantity of it will be thrown out in the firſt vomitings. In repeated vomitings the whole of it is thrown out, ſo that it is always a moderate and manageable emetic, and as we judge, may be ſuited to many of the purpoſes of the ipecacuanha. It appears from writers, that the leaves alſo have been commonly employed, and perhaps with equal advantage; but as I did not find it eaſy to aſcertain the doſe of theſe, my experiments have been only with the roots.

ERIGERUM.

THIS is a more acrid ſubſtance than the materia medica writers ſeem to have ſuppoſed it to be; but from them I have no accounts of it that can lead me to any obſervation. It has been ſometimes by our lower people employed as a powerful emetic; but I have not had any proper information upon this ſubject. It is not on that account that it has been inſerted in my catalogue; but it was to direct my reader's attention to the ſingular power of it externally applied, as reported by my learned friend Dr STEEDMAN, in the Edinburgh Medical Eſſays, Vol. II. art. v.

IPECACUANHA.

IT does not ſeem as yet to be well aſcertained what genus of plants this celebrated root belongs to, or if to one genus only; but not being fit of myſelf to ſettle this matter properly, I muſt leave it entirely to the botanical critics. For my purpoſe at preſent, it is enough to obſerve, that what for a long time paſt has been brought into our ſhops ſeems to have been very uniformly the ſame; and it is this that has been the ſubject of my obſervation and experience, and therefore what I am to ſay now relates entirely to this.

THIS root then conſiſts of a cortical and medullary part; and

I am from ſome experiments perſuaded, that it is in the former only that the emetic quality is to be found. In this cortical part it ſeems to be a reſinous matter; and accordingly it may be extracted by ſpirit of wine: but at the ſame time the reſinous matter is ſo intimately blended with, and adheres ſo tenaciouſly to, the gummy portion, that the emetic quality can be very well extracted by more watery menſtruums. Dr LEWIS adviſes a menſtruum of one part pure ſpirit, and two or three parts of water. This perhaps may be the moſt proper; but a thin wine anſwers the purpoſe very well, and our Diſpenſatories have not thought of employing any other.

THIS medicine is employed either in the wine or in the powder; and the latter, as operating in a ſmaller doſe, gives a more manageable emetic: for the powder is pretty certainly thrown out in the firſt vomitings, and therefore ceaſes to operate, whilſt the wine often adheres longer to the ſtomach.

THE medicine in either form proves very certainly emetic; and the powder, to the quantity of a grain, or perhaps leſs in many perſons, can hardly be given without exciting nauſea and perhaps vomiting. Such ſmall doſes do not indeed always produce theſe effects; but as they frequently do, we mention them to ſhow that ſmall quantities often operate upon the ſtomach: and the inſtances of it make me ready to believe the accounts which have been reported of the cure of diſeaſes by very ſmall doſes of this medicine.

AMONG theſe reports I have difficulty in giving faith to thoſe of Dr PYE, reported in the London Medical Obſervations, Vol. I. art. 22. whilſt he gives no account of the nature of the ipecacuanha that he employed, as different from, or of ſuperior power to, that in common uſe with us. In this, though I have often obſerved in certain perſons the effects of ſmall doſes above mentioned, yet they are not to be obſerved in every perſon; and I can aſſert, that in nine perſons of ten they will hardly appear from doſes under five grains. For exciting vomiting, and eſpecially to excite repeated vomitings, we hardly depend on any doſe under ten grains, and frequently a larger doſe is required. It appears to me that the ſmall doſes would hardly anſwer our purpoſe without the aſſiſtance of warm water. Larger doſes indeed may be given with ſafety, becauſe, as we have ſaid, they are commonly thrown out in the firſt vomitings: but even on this account, they do not anſwer the purpoſe that may be required of repeated vomiting; and our practitioners commonly find, that to give any powerful or permanent ſtimulus to the ſtomach, it is neceſſary to add to the ipecacuanha ſome portion of emetic tartar.

IPECACUANHA may have all the effects which we have above aſcribed to emetics in general; and upon that ground the medicinal powers of this medicine may be underſtood: but I ſhall here make a few remarks that more particularly relate to it. We have juſt now explained why it is not with any certainty ſuited to give a powerful or permanent ſtimulus to the ſtomach; but on this very account for the mere evacuation of the contents of the ſtomach, it is the medicine that can be employed with the greateſt eaſe and ſafety; and wherever it is proper to employ a moderate vomiting only, as for promoting the paſſage of a biliary concretion through the biliary ducts, it is the moſt proper emetic, as its ſtimulus may be ſafe, and at the ſame time more effectual than the other gentle means of exciting vomiting which we have mentioned above.

ALTHOUGH ipecacuanha is ſeldom fitted to produce the effects of ſtrong vomiting, it is by the mildneſs of its qualities adapted to ſeveral uſeful purpoſes. As ſmall doſes of it, not ſufficient to excite vomiting, paſs over the pylorus, they pretty certainly act upon the inteſtines, promote their periſtaltic motion downwards, and commonly occaſion more or leſs of evacuation by ſtool; and it is upon this that I ſuppoſe to have been founded the formerly celebrated antidyſenteric virtue of ipecacuanha.

IF I am right in my opinion of the nature of dyſentery, as I have explained it in my *Firſt Lines*, it will be evident, *a priori*, that the cure of it muſt depend upon the ſteady ſupport and determination of the periſtaltic motion of the inteſtines downwards; and it ſeems to be as certainly proved in fact, that the cure is beſt obtained by the aſſiduous uſe of laxative or purgative medicines. From what experience we have had, we are perſuaded that wherever neither inflammation nor putreſcency have taken place, a dyſentery will always be readily cured by theſe means.

WHATEVER explanations have been offered of the operation of ipecacuanha in this diſeaſe, we can find no other admiſſible or tenable but that of its laxative power; and in confirmation of this it has been often obſerved, that ipecacuanha does not anſwer the purpoſe, unleſs when it proves more or leſs purgative: and a confirmation of the ſame occurs more ſtrongly from this, that other emetics proving laxative are equally or more effectual. See the learned Sir GEORGE BAKER, *De Dyſenteria*, p. 26.

THERE have been many other virtues aſcribed to the ipecacuanha; but all of them appear to me to depend upon its emetic powers alone, and that they truly may be obtained by the uſe of other emetics. We might therefore ceaſe from ſaying more of this drug; but I ſhall ſtill make a remark or two on ſome particular uſes of it.

It has been particularly commended in the cure of intermittent fevers; and I knew a practitioner who cured theſe, by giving, an hour before an acceſſion that was expected, five grains, or ſo much as would occaſion a ſtrong degree of nauſea and ſickneſs, without vomiting; and by one or two ſuch practices he was frequently ſucceſsful. It is true that this may be executed by tartar emetic, and I recommended the trial of this to the practitioner I ſpeak of; but he aſſured me, that in ſeveral trials he could not eaſily adjuſt the doſe of this, ſo as to produce the proper degree of ſickneſs without vomiting, ſo well as he could do by the other.

Dr Thomson, formerly of Montroſe, propoſed to cure agues by the employment of emetics given at the time of acceſſion, or at the end of the cold ſtage: and this practice has alſo been ſucceſsful, and may indeed be executed by tartar emetic; but in trying ſuch practices I have found the ipecacuanha more manageable than the other, and generally to be more eaſy to the patient.

The mildneſs and manageable quality of the ipecacuanha has made ſome phyſicians endeavour to employ it in continued fevers; but we have always obſerved, that the readineſs with which even ſmall quantities excite vomiting, and are to be thrown out by it, commonly prevented our obtaining that permanent nauſea that we judge to be neceſſary.

To finiſh my remarks upon this medicine, I have to obſerve, that, like other emetics, it has been employed in the cure of hæmorrhagies. And if their ſalutary effects, in ſuch caſes, eſpecially depend upon inducing the firſt degrees of nauſea, I leave it to the ingenious practitioner to judge, whether the ſmall quantities in which ipecacuanha will operate, may not render this a fitter medicine than ſome other emetics.

AFTER the ipecacuanha in my catalogue, I have ſet down the Nicotiana: But in treating of this above as a ſedative, as I have ſaid all that is neceſſary with reſpect to its being employed as an emetic, it ſeems unneceſſary to repeat any part of that here.

THE next article is that of

SCILLA.

THIS, with its expectorant and diuretic powers, has always joined that of ſtimulating the ſtomach and of exciting vomiting.

FOR this ſingle purpoſe it was ſometimes formerly employed; but ſince the uſe of ipecacuanha has become known, the ſquills have been more rarely uſed; and in my opinion they have been juſtly neglected, as I find the doſe of them not to be eaſily aſcertained; and in a full doſe they appear to me to be a harſher and leſs manageable emetic than the ipecacuanha.

WE CANNOT however paſs this ſubject without obſerving, that we can never preſume upon the operation of ſquills in any manner, without their being given in ſuch quantity as to excite ſome degree of nauſea; a circumſtance that renders the ſquills a diſagreeable remedy, but an attention to it ſeems to be always neceſſary.

WE have now mentioned the vegetable emetics of our catalogue that are neceſſary to be taken notice of here; as what relates to the uſe of the Amara, the Sinapi, and Raphanus Ruſticanus, we have ſpoken of fully enough above, either as aſſiſtants to the operation of warm water, or as by the aſſiſtance of that they may become uſeful emetics.

HAVING therefore now conſidered the vegetable emetics, I am next to take up the ſubject of the foſſil.

THE firſt of theſe mentioned in my liſt are the preparations of copper. And many of theſe, as very univerſally emetic, might perhaps be employed; but they are ſeldom fit to be ſafely or properly managed.

I have known the *Blue Vitriol* employed, but rather as a nauſeating doſe in the beginning of fevers, or as a diuretic in dropſies, than as an emetic fit to occaſion full vomiting; and when it has the laſt mentioned effect, it is always harſh and unmanageable, and we cannot perceive that it has any better effects than thoſe of tartar emetic. The effects of it in beginning conſumptions we have not had any experience of. Its external uſe as an eſcharotic is ſufficiently known: but I muſt obſerve, that in many ulcerations it has appeared to me more uſeful than any other: and very lately, in an ill-conditioned and ſpreading ulcer, I found it bring on a good digeſtion, when both mercurials and arſenic had failed.

WITH reſpect to the mercurial emetics, I believe that moſt of the ſaline preparations of mercury, if given in large doſes, might operate as emetics; but, as in the examples of the corroſive ſublimate, they would be employed with very great danger. The mercurial emetic that has been chiefly and almoſt only employed is the turpethum minerale, or mercurius emeticus flavus: but as this muſt be employed in a very large doſe, and always operates in a ſevere and dangerous manner, I am diſpoſed to aſſert, that it is never neceſſary to uſe it for the purpoſe it was formerly employed, that is, to excite a ſalivation; nor that it is ever neceſſary for removing ſome obſtinate venereal ſymptoms, ſuch as ſwelled teſticles, as I believe that ſuch ſymptoms may be as well cured by ſafer means.

OF the preparations of zinc, the vitriolum album is that only employed as an emetic. This has been chiefly employed on account of the ſuddenneſs of its operation, which is frequently required when noxious or poiſonous matters have been accidentally taken into the ſtomach. We do not however always find the white vitriol to be the moſt convenient for this purpoſe: for in order to render its effects certain, the doſe muſt generally be large; and if this is not thrown out again immediately, it is apt to continue a diſagreeable nauſea, or even a vomiting, longer than is neceſſary.

I FIND that the purpoſe of this medicine, that is, a ſudden vomiting, may commonly be obtained by employing a large doſe of ipecacuanha, either in powder or in the vinum; and by following this ſoon after with a large draught of warm water impregnated with chamomile, or rather with what is more at hand, a tea ſpoonful of table muſtard, the buſineſs may be commonly very effectually executed.

ANTIMONIUM.

THIS, under a certain preparation, affords the metallic emetic now moſt commonly employed. It is one of the ſafeſt and moſt manageable, and may commonly be rendered ſufficiently effectual for every purpoſe of emetics.

WITH reſpect to it, this is firſt to be obſerved, that, as produced in the earth, it is a combination of a metallic ſubſtance with common ſulphur; and while it is in this ſtate, when we name it *Crude Antimony*, it appears to me to be an inert ſubſtance with reſpect to the human body.

THIS, however, is not the univerſal opinion; and its manifeſt effects upon horſes favours the ſuppoſition that it may have effects alſo on the human body. Many phyſicians have adopted the ſuppoſition; and particularly the chemiſt KUNCKEL alleged, that by levigation brought into a very fine powder, it was uſeful in ſeveral diſeaſes, particularly in rheumatiſm. After ſeveral trials, however, of giving a dram of this powder once or twice a day for ſeveral weeks together, I have not found it of any benefit. I knew a phyſician who had an opinion of its being uſeful in cancers, and he gave the powdered antimony to two drams for a doſe; but I could never perceive that any ſenſible effects, or that any effects either upon the cancerous tumour or ulcer were produced. I muſt own, however, that in one or two inſtances in which the crude antimony was largely employed, ſome nauſea, and even vomiting, were produced; ſo that I was reſtrained from carrying the doſe farther than I had already done. This indeed obliges me to acknowledge, that on ſome occaſions crude antimony may be an active medicine; but at the ſame time I muſt allege, that it can hardly ever be proper to employ ſuch an uncertain medicine as the crude antimony, when I ſuppoſe we may obtain the ſame effects by one of its preparations, whoſe doſe and operation can be more exactly meaſured.

Supposing therefore the crude antimony laid aſide as at leaſt generally inert, we are next to inquire into the means of bringing it into an active ſtate. What are the means of giving it activity, we ſhall endeavour to point out very fully hereafter; but, as in other inſtances of this treatiſe, I think it proper to conſider firſt the general effects of it in all its active ſtates.

These are univerſally and conſtantly its exciting vomiting, or ſuch a degree of action on the ſtomach as is common to other emetics given in ſuch doſes as do not excite full vomiting. The medicinal effects of antimony, therefore, are all thoſe which we aſcribe to full vomiting, or to the more partial operation of emetics as above explained.

But antimony, in its active ſtates, differs from other emetics. When it is employed either to excite full vomiting, or to produce a more partial affection, the ſtimulus given by it to the ſtomach is ſtronger than that of ipecacuanha; and therefore it excites the action of the parts employed in vomiting in a ſtronger degree. It therefore more powerfully evacuates the ſtomach; and as it is not ſo readily thrown out again, it is fitter to excite repeated vomitings, and thereby to occaſion a more complete evacuation.

It will at the ſame time be obvious, that the ſame force of ſtimulus will produce more certainly all the effects we have aſcribed to full vomiting in evacuating the upper part of the inteſtines, in emulging the biliary ducts, and in expeding the motion of the blood in the veſſels of the liver, or in the other abdominal viſcera.

It is equally obvious that the ſame force of ſtimulus applied to the ſtomach will be more certainly communicated to the ſurface of the body, and thereby ſhow the effects of nauſeating doſes in fevers, and in many cutaneous diſorders. Farther, whatever virtues may have been aſcribed to ipecacuanha in aſthma and in hæmorrhagies, I have found by experience they may be generally obtained by a proper management of antimony; and, upon the whole, from what has been now ſaid, I hope we may have a pretty complete view of the medicinal virtues of this celebrated medicine.

Having now ſpoken of theſe virtues, I am next to ſay how they are to be obtained; that is to ſay, how, from the crude antimony, which we conſider as inert, the moſt active antimonial medicines are to be obtained.

To this purpoſe we ſuppoſe it agreed upon, that the ſulphur of crude antimony does not differ from common ſulphur; and therefore, that peculiar medicinal virtues are to be obtained only from its metallic, or, as it is commonly named, its Reguline part.

With reſpect to this, however, it is in the *firſt* place to be obſerved, that, like all other metallic ſubſtances, this, in its pure metallic ſtate, is abſolutely inert with reſpect to the human body; and that, in order to its becoming active, it muſt be brought into a ſaline ſtate, either by its being combined with an acid before it is introduced into the body, or by its being brought into a ſtate in which it may be acted upon by the acids it may meet with in the ſtomach.

THE execution of either of theſe purpoſes has given much employment to the chemiſts, and has produced all the various preparations, as they are juſtly called, of antimony. The preſent ſtate of chemiſtry however is ſo complete and correct with reſpect to antimony, and the pharmaceutic treatment of it is ſo commonly underſtood, and ſo clearly delivered in all our books of chemiſtry and pharmacy, that it is not very neceſſary for me to repeat it here. But for the ſake of a few remarks that I have to offer, I beg leave to attempt a ſhort ſyſtem on the ſubject.

I BEGIN with thoſe means of putting antimony into a ſtate in which it may be acted upon by the acids of the ſtomach.

IT is in this ſtate, particularly when it is a pure regulus, entirely free from the ſulphur with which it had been joined in its native ſtate; and in this reguline ſtate, it may, for reaſons we ſhall give hereafter, be thrown into the ſtomach in large quantity.

BUT here it may be proper to remark, that as antimony may be brought into its reguline ſtate by various means, and particularly by various other metals employed for abſorbing and ſeparating the ſulphur of the crude antimony; ſo it has been imagined that, according to the metal employed, there was ſome difference to be found in the regulus obtained: but it has now been diſcovered, that there is little foundation for this either with a view to chemiſtry or medicine.

ALTHOUGH the regulus might be, it is now ſeldom, employed as a medicine, and eſpecially as it is found to be enough to have it free from a part of that ſulphur which prevented it from being acted upon by acids in its crude ſtate; and it is found that the abſtraction of a portion of that ſulphur is commonly ſufficient for putting it into a ſtate in which it may be acted upon by acids even of the mildeſt kind. Accordingly, for rendering it fit to be acted upon by the acids of the ſtomach, the chemiſts have contrived the various preparations by which more or leſs of the ſulphur is abſtracted from the crude antimony.

IT may be done, in the *firſt* place, by a proper calcination, to ſuch a degree, that the remaining matter may be fuſed into a glaſs, which we find to be readily acted upon by acids, and to ſhow the ſame emetic qualities that are to be found in any other active preparation. This vitrum antimonii is found to be ſo readily ſoluble as to prove one of the moſt active preparations; but it is proper to be remarked here, that this preparation may be rendered milder by ſome calcination with wax, as in preparing the vitrum antimonii ceratum. The theory of this operation is not very obvious; but I can aſſert, that the mildneſs of the preparation depends upon the degree of calcination given: for I know from experiment, that by puſhing the calcination beyond a certain degree, the medicine can be rendered abſolutely inert, and no longer ſoluble in acids.

A SECOND means of abſtracting a portion of the ſulphur of antimony, is by the application of alkalines. This may be done firſt by fuſing antimony with a portion of alkaline ſalt, which abſtracts a part of the ſulphur, and with it forms a ſcoria upon the ſurface of the melted maſs, while the part ſubſiding from that gives the regulus medicinalis of HOFFMAN and others. This is ſoluble in acids, and, thrown into the ſtomach, ſhows emetic qualities; but which are commonly in a moderate degree.

A MORE common practice for abſtracting the ſulphur of antimony, is by applying to it a cauſtic alkaline lixivium. This applied with a boiling heat, readily diſſolves a conſiderable portion of the ſulphur of antimony, and in greater proportion than it does the reguline part, though at the ſame time a portion of this is alſo taken up. That part of the ſulphur which has the greateſt proportion of reguline matter adhering to it cannot be ſuſpended but by a boiling heat; and therefore, upon the cooling of the lixivium, this falls down to the bottom of the veſſel in the form of a reddiſh powder, which is named KERMES *Mineral.*

THE other portion of the regulus taken up by the lixivium may be readily ſeparated from it by the addition of an acid; and the matter in that caſe precipitated is what was named the Sulphur Auratum, and now the *Sulphur Antimonii Præcipitatum.*

IN both theſe preparations, the KERMES mineral and ſulphur auratum, the proportion of ſulphur is not, with reſpect to the reguline part, ſo great as to prevent this from being acted upon by acids; and therefore, thrown into the ſtomach, it proves an active medicine. Both the Colleges of London and Edinburgh ſeem to think theſe medicines nearly of the ſame quality, by their preſcribing only the ſulphur antimonii præcipitatum, and giving no place to the KERMES mineral; but I am humbly of opinion, that the latter is the more active medicine, and is more uniformly the ſame, in different preparations, than the former.

A THIRD, and the moſt ordinary means of abſtracting the ſulphur of antimony, is by the application of nitre; which, when the two ſubſtances are together expoſed to the action of the fire, deflagrates with, and diſſipates the ſulphur. The effect of this is different according to the proportion in which the nitre is applied to the antimony.

If ſomewhat leſs than a fourth part of the nitre is applied, a portion of the ſulphur is abſtracted; and ſo much, that the remaining maſs may be acted upon by acids, and gives what is much the ſame with the regulus medicinalis mentioned before.

If the proportion of nitre is equal to that of the antimony, the matter remaining after deflagration makes the noted *crocus metallorum*, readily ſoluble in vegetable acids; and therefore, thrown into the ſtomach, gives one of the moſt acrid preparations of antimony.

But if the proportion of the nitre be ſtill farther increaſed as to double the quantity of the antimony, the ſulphur of this is not only diſſipated, but the metal is at the ſame time calcined, ſo as to be leſs ſoluble in acids than the crocus. In this ſtate, however, it commonly remains ſo far ſoluble as to give the *Emeticum mite* of BOERHAAVE.

In treating antimony with nitre, if the antimony be calcined ſo far as to render it fit to be fuſed into a glaſs, and in this ſtate be deflagrated with an equal part of nitre, the calx nitrata of the Edinburgh Diſpenſatory is produced; which is a matter ſtill ſoluble in acids, and in that reſpect very much in the condition of the emeticum mite juſt now mentioned.

It is ſuppoſed that the celebrated JAMES's powder is very much the ſame with the calx nitrata; and the appearance of the two powders, the doſe in which they may be employed, and their operation in the ſtomach, renders this to me very probable.

LASTLY, if the nitre applied to the antimony be in the proportion of three parts to one of antimony, this is more entirely calcined, and rendered abſolutely inſoluble in vegetable acids. It is what is named the Antimonium Diaphoreticum, or Antimonium Calcinatum: a ſubſtance formerly ſuppoſed by many to be of ſome power and virtue; but the Edinburgh College are ſo far from thinking ſo, that they have not given it a place in the laſt edition of their Diſpenſatory.

THESE are the chief of the preparations ſtill retained in uſe, in which antimony is put into a ſtate of being acted upon by vegetable acids; and therefore, when thrown into the ſtomach, to ſhow more or leſs of an emetic power: and they ſeem to be different from one another only by the quantity of the reguline part in them being more or leſs in a ſoluble ſtate.

IT is hardly neceſſary to obſerve, that the operation of theſe ſeveral preparations ſeems to be alſo different according to the quantity, and perhaps the quality, of the acid that they meet with in the ſtomach; and therefore that their operation is ſo different in different perſons, and even in the ſame perſon at different times.

AFTER treating of theſe preparations, we muſt in the next place mention thoſe which may be made by a combination of the regulus of antimony with acids, before its being thrown into the body.

OF the foſſil acids, it is to me doubtful if either the nitrous or vitriolic can be managed ſo as to give an active antimonial preparation; but the muriatic is in this reſpect very powerful.

ANTIMONY, combined with the muriatic acid in a fluid form, gives the ſtrong cauſtic fluid named Butter of Antimony, and which we have ſpoken of above under the head of Corroſives. From this, however, the acid can be abſtracted to ſuch a degree, that the combination may be brought into the form of a cryſtallized ſalt, which has been named *Mercurius Vitæ*. This has been formerly employed in practice as an emetic; but its operation is ſo violent, that the preſent practice entirely avoids it.

THERE remains therefore only to ſpeak of the vegetable acids, which may be applied to antimony to give an emetic of the kind we now treat of.

THE liquid vegetable acids have been, in their ſeveral ſtates, employed for this purpoſe; but as their different ſtates are not eaſily aſcertained to be at different times the ſame, they have been all laid aſide; and wine, which always contains a ſufficient portion of acid, is the only menſtruum now employed. Moſt of the wines in common uſe might be employed; but both the Colleges have agreed to employ the common Spaniſh white-wine only. The London College applies this to the crocus metallorum; but the Edinburgh apply it to the vitrum antimonii, with, however, no different effect in the two preparations that I can perceive. The two Colleges employ the menſtruum in a different proportion with reſpect to the ingredients they employ; but this makes no difference, as the wine diſſolves only a certain quantity in proportion to its own bulk, which it can always take from the ingredient that is in the ſmalleſt proportion to the whole of the wine employed, and this at leaſt in the quantity of wine that is applied in our Diſpenſatories. This alſo explains a circumſtance well known to practitioners; which is, that if due care be taken to ſeparate, by a filtration, the ingredient from the wine, the doſe of this is never to be eſtimated by the proportion of the ingredient infuſed, but merely and exactly by the quantity of wine that is employed in ſuch a doſe.

THE other vegetable acid which, applied to antimony, may afford the emetic in queſtion, is that which is found in the cryſtals of tartar. This applied with a large proportion of water to one of the moſt active preparations of antimony, is found to diſſolve a conſiderable quantity of the reguline matter, and, by a proper evaporation, to give the noted Tartarum Emeticum. The London College, on this occaſion, employ the crocus metallorum, whilſt the former editions of the Edinburgh Diſpenſatory employed the vitrum antimonii; but little difference was found to reſult from this difference of the ſubject. With reſpect to both it was alleged, and I believe juſtly, that from ſome difference in the encheireſis, the medicine came out of unequal ſtrength, and that it was difficult, in the hands of different chemiſts and apothecaries, to bring it to a ſtandard, which is however much to be deſired. On this account the Edinburgh College have given a new preſcription, which they think may ſerve to give a more ſteady and uniform preparation; and I am perſuaded that, when properly executed, it will do ſo: but our apothecaries have not yet complied with the preſcription, ſo as to give me an opportunity to judge of it from experience.

THE emetic tartar, as commonly prepared, is a ſafe, and under any proper management a ſufficiently effectual, preparation for every purpoſe of emetics that we have mentioned above;

and

and after a few trials of any new made preparation, we can aſcertain the doſe of it pretty exactly.

There remains, therefore, on this ſubject, one queſtion to be conſidered; and that is, as we have referred the whole of the preparations to two heads; the one of thoſe in which the antimony, without being combined with any acid before it be thrown into the ſtomach, is only put in a condition in which it may be acted upon by the acid which it meets with there; and the other is of thoſe in which the regulus is previouſly combined with an acid before it be thrown into the ſtomach; the queſtion is, Whether the one ſet of theſe preparations have any advantage over the other? I am clearly of opinion, that the former have no advantage over the latter; and though there may be many inſtances of the good effect of the former, the uncertainty of its doſe would make me prefer the latter, in which the doſe may be pretty exactly aſcertained: and I can ſpeak of it from much obſervation, that the uncertainty of the doſe of the former has often given occaſion to the timid practitioner to be diſappointed, and to the hardy to do much miſchief.

CHAPTER XX.

CATHARTICA.

THESE are medicines which evacuate the inteſtines downwards; or, as the common language is, promote and excite the evacuation by ſtool, and which, when any thing copious, we ſhall name a purging.

THIS evacuation muſt always be produced by increaſing the periſtaltic motion of the inteſtines downwards; and there are various ſtates of the ſyſtem which, without the application of any medicine, may occaſion this; ſuch as obſtructed perſpiration, cold applied to the lower extremities, and ſome other circumſtances which are not to be further taken notice of here, where we are only to conſider the evacuation mentioned, as produced by the application of certain ſubſtances directly to the inteſtines themſelves; and theſe are ſtrictly the cathartics to be treated of here.

Of theſe, the firſt thing to be obſerved, and which has always been obſerved, is, that the medicines employed are of different degrees of force or power in producing the evacuation: and it is to be deſired, that in this reſpect they could be aſſorted into different claſſes, and that it could be determined upon what grounds beſides that of an inaccurate and unequal experience they might be arranged under the two titles of Mitiora and Acriora. It may be difficult to do this with any preciſion; but I think it worth while to attempt it.

To this purpoſe I conceive, that there are ſubſtances which are only capable of ſtimulating the extremities of the exhalant veſſels, or the excretories of the mucous follicles; by both which irritations, a large quantity of fluids may be drawn into the cavity of the inteſtines, and thereby a copious evacuation by ſtool be produced, without much increaſe of the periſtaltic motion.

Although I have put this ſuppoſition, I cannot certainly determine that there are any medicines which thus act upon the excretories without ſtimulating the muſcular fibres of the inteſtines; and I believe it is moſt ſafe to ſuppoſe, that every medicine which increaſes the evacuation by ſtool, acts more or leſs by ſtimulating the moving fibres of the inteſtines, and by increaſing the periſtaltic motion, produces the evacuation.

This being therefore ſuppoſed, I would however enquire if there is not a difference in the nature of the ſtimulus given by different cathartics; and I am perſuaded that ſuch a difference may be perceived. In Glauber's ſalt, for example, a ſtimulus is applied to the moving fibres of the inteſtines: but it does not ſeem to be capable of exciting inflammation in the coats or fibres of the inteſtines, nor of exciting heat in any other part of the ſyſtem; whereas in jalap we know that there is an acrid reſin, which, applied in a certain manner, inflames the inteſtines, and excites a conſiderable degree of heat in the reſt of the ſyſtem. Theſe two ſubſtances I take for examples of the aſſortment that may be made of cathartics, and the grounds on which I have proceeded in arranging them under the two heads of Mitiora and Acriora, or under thoſe of a cooling or of an inflammatory kind. I have not indeed, in this reſpect, under the firſt title in my Catalogue, been ſufficiently correct, and I find it difficult to be ſo: but I ſhall endeavour afterwards to mark what corrections it may be proper to make.

IN the mean time, I would fix, as well as I can, to the firſt ſet the term of *Laxatives*, and to the other the term of *Purgatives;* intending by theſe appellations not to expreſs the degree of power as has been uſual, but the manner of their operating.

HAVING thus endeavoured to give an idea of cathartics in general, before proceeding to particulars I ſhall endeavour to conſider their more general effects.

THE firſt effect of them to be taken notice of, is the very general one of their promoting the evacuation of the contents of the inteſtines for the time preſent in them; which may be eſpecially neceſſary when any unuſual, noxious, and acrid matters are a part of theſe.

THE next circumſtance in the operation of cathartics to be taken notice of is, that it extends to the whole length of the alimentary canal, from the upper orifice of the ſtomach to the lower extremity of the rectum. There may be ſubſtances which are particularly ſuited to promote the evacuation of the ſtomach downwards, but we are uncertain of this; and we mean here to obſerve, that the operation of cathartics, though only and directly on the inteſtinal canal, ſerves to evacuate the ſtomach; and therefore, that cathartics are ſo often uſeful in many of the diſorders of this important organ.

IN the next place, we are to conſider more ſtrictly the operation of cathartics upon the inteſtinal canal, and the effects of this upon the inteſtines themſelves; and theſe are, in the firſt place, to promote the periſtaltic motion when preternaturally ſlow or obſtructed.

THE ſlowneſs of the periſtaltic motion ſeems to be often in fault; but it is not eaſy, in different caſes and perſons, to ſay when it is preternaturally ſo. The frequency of ſtools is very different in different perſons; and it is not determined what is natural and moſt healthy in this reſpect. What ſeems to be moſt probable is, that in every perſon a ſtool ſhould occur once in the courſe of every twenty-four hours; and we believe that this is truly the moſt frequent caſe: but there are ſo many inſtances of longer intervals without any inconvenience, that it is very doubtful if, with reſpect to different perſons, this could be eſtabliſhed as a general rule. I am, however, clearly of opinion, that every conſiderable deviation from a diurnal ſtool may be conſidered as an approach to an unnatural ſtate.

IN this buſineſs, however, it is to be obſerved that, beſides the delay of ſtools, there is another circumſtance to be taken notice of, which is, that whenever ſtools are delayed, it is probable that there is eſpecially a ſlowneſs in the action of the great guts, by which a larger proportion of fæces is accumulated there, and acquire alſo a greater degree of firmneſs and hardneſs; whence they are often voided with difficulty and pain, and thereby give occaſion to many diſorders in the lower inteſtines, and even in the whole ſyſtem. This is what we name a ſtate of coſtiveneſs, and which generally depends upon the ſlowneſs of the periſtaltic motion, and upon what is the conſequence of this, the increaſed bulk and hardneſs of the fæces.

THIS ſtate generally indicates the uſe of cathartics of one kind or other; and in order to be guided in the conduct of theſe, we judge it to be proper here to enquire more particularly into the cauſes of this ſtate. The firſt we would aſſign is the weakneſs of the periſtaltic motion; and accordingly it is obſerved that a ſlow belly is often attended with other marks of that weakneſs, and on that account occurs very frequently in the female ſex, who are often of a ſlow belly, and ſuffer many inconveniences from it.

ANOTHER cauſe of a coſtive habit is of a contrary kind, and depending upon the vigour and rigidity of the alimentary canal. In this ſtate, as ſome degree of torpor always attends ſtrength, ſo the contents of the inteſtines are moved more ſlowly onwards; but at the ſame time the concoction, if I may uſe the expreſſion, of the aliments, is more completely performed, and probably a ſmaller proportion of fæces is produced. At the ſame time alſo, as the abſorption of the more liquid parts is more completely performed, a ſmaller proportion of fæces are depoſited in the great guts, and that alſo in a drier ſtate: from both of which circumſtances we may underſtand why, in rigid and robuſt perſons, a coſtiveneſs ſo commonly takes place.

NEARLY the ſame caſe with this, ſeems to be that of hypochondriac or melancholic perſons; in whom, with rigid viſcera, there is a preternatural torpor in the motions of the whole ſyſtem, and particularly in the inteſtinal canal.

UPON this ſubject, we judge it proper to mention ſome other cauſes of coſtiveneſs. One of which may be a deficiency of bile, which we ſuppoſe to be a chief means of ſupporting the motion of the inteſtines downwards. We cannot indeed always perceive when this occurs; but that it may occur, we preſume from the caſe of a jaundice, which is commonly attended with a ſlow belly.

ALTHOUGH we cannot always perceive the deficiency of bile, or of pancreatic liquor, to be the cauſe of coſtiveneſs, we can with probability, as a cauſe of it, aſſign the abſtraction of the other inteſtinal fluids. This we ſuppoſe muſt neceſſarily happen from an increaſed perſpiration, which I have more frequently obſerved from any very conſtant mode of geſtation than from bodily exerciſe; and it is in this manner that I would account for the effects of the conſtant geſtation in ſailing in producing coſtiveneſs, which ſo generally happens to perſons at ſea.

To the cauſes of coſtiveneſs ariſing from the ſtate of the ſyſtem, I have but one other to add; and that is, any conſiderable compreſſion of the inteſtines which I have had occaſion to obſerve from a ſteatomatous tumour of the omentum, and which alſo happens ſo frequently from the compreſſion of the uterus in pregnant women.

WE have now mentioned the ſeveral cauſes of preternatural ſlowneſs in the motion of the inteſtines which may indicate the uſe of cathartics; and I have alſo ſaid they are indicated when the paſſage of the contents is entirely interrupted. It is well known that this happens when any portion of the inteſtines is affected with a ſpaſmodic and a ſomewhat permanent conſtriction. As this is commonly attended with pain, it gives the diſeaſe named Cholic; and this, with ſome other obſtructions which we cannot clearly aſcertain, require the uſe of cathartics; but without entering into the nature of theſe particular ailments, which cannot be properly done here, I cannot ſay more on the ſubject in this place.

AFTER mentioning theſe operations of cathartics upon the inteſtines themſelves, we proceed to mention the effects of their operation upon the other parts of the ſyſtem.

THE firſt of theſe to be mentioned is the evacuation and diminution of the fluids that takes place with reſpect to the whole ſyſtem. The great length of the inteſtinal canal, holding generally in its cavity a quantity of liquid matter, and therefore this alone, when carried out more ſuddenly by the operation of cathartics, may often afford a large evacuation; but when it may be preſumed that the cathartics at the ſame time excite all the excretions by which liquids are commonly poured into the inteſtines, as bile, pancreatic juice, ordinary exhalation, and the effuſion of mucus ready to be poured out, it will be evident that cathartics, even by a moderate ſtimulus applied, may occaſion a very large evacuation and diminution of the fluids of the body; and this more conſiderably as the ſtimulus applied to the moving fibres of the inteſtines is ſtronger.

CONSEQUENTLY it is obvious, that the evacuation by ſtool may be ſo large as to diminiſh the quantity of fluids in the whole ſyſtem; and therefore, that whenever ſuch a diminution is indicated, it may be obtained by the uſe of ſuch medicines: and I need not ſay that particularly by this means any preternatural increaſe of the activity, or of the active powers of the ſyſtem, may be thus greatly diminiſhed.

IT is at the ſame time however to be remarked, that although by purging a great debility of the ſyſtem may be induced, it may not produce any great evacuation of the ſanguiferous ſyſtem. A large evacuation by ſtool may ſometimes be merely of the contents for the time preſent in the inteſtines, and therefore not drawn from the blood-veſſels: and though the evacuation may be ſtill larger by what is drawn from the mucous follicles, this we know may be very copious from the matter contained in the follicles themſelves, without much liquid being drawn from the blood-veſſels. The evacuation indeed may alſo be increaſed by what is drawn from the arteries by the exhalant veſſels; but as this muſt be drawn off ſlowly in very divided portions, it can have little effect, and at leaſt no ſudden effect in the depletion of the ſanguiferous ſyſtem: and from the whole it will appear, that the evacuation by ſtool may be very large, without much effect in taking off the tenſion and tone of the blood-veſſels. In this reſpect, indeed, it ſeems to fall far ſhort of the powers of blood-letting, though this be contrary to the common opinion, and even contrary to the practice of SYDENHAM: but accordingly we have not found purging to be of very great effect in taking off the phlogiſtic diatheſis of the ſyſtem.

BESIDE the general evacuation of the whole ſyſtem, purging is powerful in changing the diſtribution of the blood into the ſeveral parts of it.

THE circumſtances according to which the diſtribution of the blood is made into the ſeveral parts of the ſyſtem, we ſuppoſe to be commonly known, and to this effect, That if an evacuation is made from one ſet of veſſels, the afflux of fluids will be increaſed in theſe, and that the afflux into other parts of the ſyſtem will at the ſame time be diminiſhed. Upon this principle it will be readily underſtood, that if the afflux of fluids in the deſcending aorta is increaſed, as it muſt be by purging, the afflux muſt in ſome proportion be diminiſhed in thoſe veſſels which carry the blood to the head. By this the quantity and impetus of the blood in the veſſels of the head muſt be diminiſhed by purging; and hence it is that this operation of cathartics has been often found ſo uſeful in the diſeaſes of the head.

IT has been commonly ſuppoſed that purging, by drawing from the ſuperior parts, may be of uſe alſo in the diſeaſes of the thorax, and in ſeveral circumſtances it may poſſibly be ſo; but practitioners have frequently obſerved, that in the inflammatory diſeaſes of the lungs, purging has not been ſo uſeful as might be expected. It is probably owing to this, that by emptying the ſyſtem of the deſcending aorta, no conſiderable derivation can be made from the bronchial arteries, in the extremities of which the inflammations of the lungs are ſeated.

MANY circumſtances ſhow that there is a balance in the diſtribution of the blood between the external and internal parts, ſo that they mutually increaſe or diminiſh one another. We have ſhown above that the increaſe of perſpiration abſtracts the fluids that ſhould be poured into the inteſtines; and it has been frequently obſerved, that an obſtructed perſpiration has occaſioned a diarrhœa If this change of diſtribution, therefore, is in general the nature of the œconomy, it will be readily underſtood why purging, by increaſing the afflux of blood to the internal, ſhould diminiſh that to the external parts, or to the ſurface of the body, and that it ſhould therefore have conſiderable effects in many cutaneous diſeaſes. Whenever theſe depend upon any inflammatory determination to the ſurface of the body, purging may be a remedy for them; and when it is foreſeen that in certain diſeaſes ſuch an inflammatory determination to the ſkin is to ariſe, and according to its violence to aggravate the diſeaſe, it will be evident that purging, by moderating or taking off that determination, may render the diſeaſe more moderate. This I take to be the foundation of the practice of purging in the approach and beginning of the ſmall-pox; and I have no doubt that this, in concurring with other meaſures, contributes to the mildneſs of the diſeaſe.

Purging therefore may be of uſe in cutaneous affections; and phyſicians have very univerſally employed this remedy in thoſe caſes, but often very improperly, as they have not attended to this, that cutaneous affections are often purely topical, and unconnected with any general ſtate of the ſyſtem, and therefore not to be cured by remedies chiefly affecting this. And upon this occaſion I cannot help taking notice that phyſicians have conſidered purging too much as a means of evacuating acrimony diffuſed over the whole ſyſtem; and as cutaneous eruptions were commonly conſidered as a mark of this, ſo, upon a doubly falſe principle, cathartics have been more frequently employed in theſe affections than they ought to have been.

There is ſtill another effect of cathartics and of purging to be mentioned. As in every cavity of the body there is an exhalation and inhalation, or abſorption, conſtantly going on, it is preſumed that there is ſome balance conſtantly preſerved between the ſecretory and abſorbent powers; ſo that if the former are increaſed, the latter will be ſo alſo: and therefore, that when the ſecretions are upon occaſion much increaſed, the action

tion of the abſorbents may be particularly excited. This explains why purging often excites the action of the abſorbents, to take up more copiouſly the fluids that were otherwiſe ſtagnant in the adipoſe membrane or other cavities of the body, and thereby often proves a cure of dropſy.

These are the different and ordinary effects of cathartics, and they are commonly the effects of them as taken in by the mouth. But, before going further, it is proper to obſerve that there are two other ways in which they are applied: The one is, by applying or anointing them on the teguments of the lower belly; and the other is, by applying them to the inteſtinum rectum, either by injecting them in a liquid form into the cavity, or by applying them in a ſolid form to the extremity of that inteſtine.

The firſt of theſe practices has been formerly employed, and, for ought I know may, upon certain occaſions, be again tried; but the uncertainty of the doſe has made me doubt of its propriety, and prevented my ever trying it.

The ſecond means, or the uſe of glyſters, is often a neceſſary, and very often an uſeful, practice; and the medicines moſt proper to be employed in it ſhall be mentioned hereafter, as ſhall alſo thoſe fit for ſuppoſitories; though I hold theſe to be ſeldom either very neceſſary or very uſeful.

PARTICULAR CATHARTICS.

MITIORA.

I HAVE begun with theſe, which I conſider as ſtrictly the *Laxantia*, making, in the ſenſe I have explained above, that is, in their manner of operating, one claſs of Cathartics. Of particulars, I have ſet down firſt the

FRUCTUS ACIDO DULCIS RECENTIS.

As all of theſe contain a quantity of ſugar, and ſome of them in large proportion, it may be a queſtion, whether their laxative quality may not be aſcribed entirely to this. And it is not obvious that the acid joined can contribute to that quality; but it ſeems to appear from experience, that theſe fruits which have an acid joined to their ſugar are truly more laxative than the more ſimple ſweets.

THE reaſon of this effect of acidity is not very evident; but it may perhaps be explained in this manner: We know that the aliments, as they paſs out of the ſtomach, are commonly more or leſs acid; but by being mixed with the bile in the duodenum, have this acidity corrected or involved, ſo as hardly to appear afterwards in the other parts of the ſyſtem; and accordingly large quantities of acid may be ſometimes taken into the body, without ſhowing any laxative effects: But there are conſiderations which lead us to believe, that the power of the bile in correcting acidity has its limits, and to judge at the ſame time, that an over proportion of acidity joined with the bile forms a mixture that is conſiderably laxative.

THIS renders it doubtful whether the laxative effects of our ſummer fruits are to be aſcribed to the ſimple combination of acid and ſweet; or if always to a mixture of bile with an over proportion of acid, either as taken in, or as acquired by fermentation in the ſtomach. We find it difficult to judge in this matter; but find it may commonly be done by the proportion in which the acid prevails in the aliment taken in, by the quantity of this taken in, and eſpecially by the ſtate of the ſtomach, known from other circumſtances to be more or leſs diſpoſed to an aceſcent fermentation.

AFTER this general diſcuſſion, we may ſpeak more clearly of particulars.

THE firſt mentioned are the Fructus recentes. Theſe may be conſidered as conſtantly laxative; but they are alimentary matters frequently taken in without ſhowing any laxative effects: and though in coſtive habits they may be adviſed to be taken in more largely as aliments, they are hardly ever to be preſcribed as medicines; becauſe the larger quantity in that caſe to be preſcribed will always be of uncertain effect, and may as readily produce a diarrhœa as prove a proper cure of coſtiveneſs.

AFTER this general obſervation I need not ſpeak of the ſeveral ſpecies; as the choice of theſe, ſo far as they can be employed in the caſe mentioned, may be learned from what was ſaid of them above when treated of as aliments.

AFTER the fructus recentes I have ſet down the *Fructus ſiccatæ*. Theſe alſo are certainly laxative, though not ſo much as the recentes; but they are employed with more ſafety, as deprived of their air: they are for the moſt part leſs aceſcent, and therefore leſs liable to have their acidity in exceſs; but at the ſame time it is to be obſerved, that theſe fruits which have more acid in their compoſition are more laxative than thoſe more purely ſweet; and it is on this account that dried prunes are conſtantly preferred to raiſins.

WITH regard to all the dried fruits it is to be remarked, that they are more powerful when they have been boiled or otherwiſe expoſed to a conſiderable heat than when taken in their raw ſtate; probably for this reaſon, that being heated, much of their air is exhaled, ſo that they are leſs liable to any exceſs of fermentation.

AFTER the fructus acido dulces I have ſet down the

CASSIA FISTULARIS,

THIS, in my opinion, is very much of the ſame nature with the fruits mentioned: and I muſt ſay further, that I have not found much advantage in the uſe of it; and I believe that other practitioners obſerving the ſame, has occaſioned its being now leſs uſed than formerly. It is now indeed hardly ever employed by itſelf, and almoſt only as entering into ſome officinal compoſitions, in which, however, we have not perceived its peculiar utility. We have particularly tried it with manna; but never found the effects of it to be ſuch as VALISNIERI alleges. It would certainly be proper for our country apothecaries to know that the pulp of prunes might be employed in the place of the more expenſive and precarious caſſia.

TAMARINDUS.

THIS is a fruit containing with its ſugar a large proportion of acid, which renders it fit for every purpoſe for which the fructus acido dulces can be employed. It is particularly laxative, though not in a ſtrong degree; and it is moſt uſeful when joined with thoſe of the ſweeter kind. The acidity of the tamarind renders thoſe more agreeable; and both together are employed with more ſafety than the caſſia or fructûs acido dulces, as the tamarind contains an acid of the nature of tartar, that renders it leſs liable to fermentation; and we have always found, that in our compoſitions of Diacaſſia, Lenitivum, and Infuſio Tamarindorum, the tamarinds may be employed more largely than they have commonly been.

THE tamarinds are commonly imported into this country as they have been taken out of their pods in the Weſt Indies; and there is commonly added to them there a quantity of ſugar, which very much changes their ſtate, and deſtroys the purpoſe of their acidity. It would certainly be very proper to have them always imported in the pods.

AFTER theſe acido dulces I have ſet down what I think akin to them, that is the *Lac ebutryatum*, as containing a ſweet and an acid combined; by which it is certainly laxative, though not very ſtrongly, except when taken pretty largely.

WE cannot ſo ſtrictly put here the recent *Serum lactis*, which might be more properly put with the Dulcia, as its ordinary laxative effect may be aſcribed eſpecially to the ſugar it contains. As this ſugar however, or ſomething elſe that milk contains, is ſo quickly aceſcent, they may be conſidered as becoming readily ſo in the ſtomach, and therefore that its laxative qualities may be ſuppoſed to depend upon its being an acido dulcis. The flatulency which ſo commonly attends its operation, and the previous boiling diminiſhing its laxative quality, are probable grounds of ſuppoſing it to act in conſequence of fermentation.

HERE I was diſpoſed to ſet down in my Catalogue fermented liquors of all kinds, as I think they may all be conſidered as res acido dulces; and in my opinion, were it not for the large proportion of alcohol that is ſometimes preſent in them, they would all ſhow a laxative power. Accordingly, in the view of their being laxatives, they are ſometimes ordered more largely in diet; but with reſpect to them, there is an idioſyncraſy of particular perſons that regulates this matter, inſomuch that the ſame wine proves aſtringent to one perſon and laxative to another. With reſpect to wines therefore, this idioſyncraſy is always to be conſulted; but I have hardly ever found it neceſſary with reſpect to malt-liquors, which I judge to be in all perſons, upon the grounds above mentioned, more or leſs laxative.

AFTER the res acido dulces, I have ſet down the more ſimple ſweets of ſugar and honey; which I maintain to be properly marked as laxatives; but all that was neceſſary to be ſaid of them in that view has been ſaid already above, under the title of the Attenuantia Dulcia; and I now proceed to a ſubject that every-one ſuppoſes to belong to this title of Laxantia.

MANNA.

THIS is a part of the ſugar ſo univerſally preſent in vegetables, and which exudes on the ſurface of a great number of them. When it exudes in a dry form, it is named Manna. In this form it appears on the ſurface of a great number of different vegetables; but how far, as proceeding from different vegetables, it is different in its qualities, does not ſeem to me to be clearly aſcertained. We are of opinion they are very little, if at all, different.

BUT however that may be, I can properly ſpeak only of that ſpecies employed in the practice of Britain, which is the manna exuding from, and concreting on the ſurface of, the Fraxinus ornus. The differences of this, as occurring from the ſeaſon, manner, and circumſtances in which it is collected, we muſt leave to writers on natural hiſtory and the materia medica, who have taken ſome pains on this ſubject: but as not having the opportunity of certain and exact information, I muſt avoid it; and I muſt, to ſpeak of its medicinal qualities, be ſatisfied with taking for the ſubject of my obſervations the pureſt kind I am acquainted with.

MANNA then, in its ſenſible qualities, does not differ from ſugar; at leaſt I cannot diſcover any peculiar taſte or acrimony that can mark any difference, and only ſome unctuoſity and mildneſs that is ſomewhat more than in refined ſugar.

NOR does manna, in its chemical qualities, differ but in the ſlighteſt degree from ſugar; and therefore, if manna has any peculiar and medicinal qualities, we have not yet diſcovered, in the conſtitution of it, upon what theſe depend. This would lead to ſuppoſe, that they are not conſiderably different from thoſe of ſugar; and we are much diſpoſed to think that this is the real ſtate of the caſe. We dare not indeed deny the laxative powers of manna; but in employing it by itſelf we could never perceive them to be conſiderable, and it is not eaſy to eſtimate its power in compounds. We have indeed ſeldom tried it ſingly; but even when we did in children we have been often diſappointed. Though the laxative powers of manna are not conſiderable, I believe them to be ſuch to a certain degree; as, in the moſt frequent employment of them along with neutral ſalts, I have thought that the manna employed ſupplied the doſe that might otherwiſe have been required of the neutral.

AFTER the Dulcia I have ſet down the Radices dulces, as thoſe of the *ſkirret*, *beet*, *carrot*, &c. as manifeſtly containing a quantity of ſaccharine matter rendering them laxative. After theſe I have put the *olera blanda*, the chief of which is the *braſſica*, containing a conſiderable quantity of ſaccharine matter diſpoſed to an aceſcent fermentation; and though not ſo remarkable for theſe qualities, I would alſo mark here the leaves of the *beet* and *ſpinage*. All theſe, though employed in diet only, as they may be preſcribed in larger quantity than uſual as laxatives, I thought it proper to fill up my liſt with every thing that might belong to this title.

LAXANTIA SALINA.

THESE are the chief of the laxantia mitiora; and they differ both from the ſaccharine laxatives we have hitherto treated of, and from the purgatives we are to treat of hereafter; being more powerful than the former, but milder than the latter. The difference in comparing them we have endeavoured above to point out and explain, and do not think it neceſſary to repeat here any account of the difference of ſtimulus given to the inteſtines by the one or the other; and therefore, ſuppoſing this explanation underſtood, I proceed to conſider particulars.

THE firſt I conſider is the fixed alkaline ſalt. The two ſpecies of this are, I believe, nearly of the ſame nature; but that intitled the Vegetable having been eſpecially the ſubject of my obſervation, what I am to ſay on fixed alkali will eſpecially relate to that.

THIS comes out ſomewhat different from ſome difference in the manufacture of it; but I am not to take any notice of theſe differences, and muſt be ſuppoſed to ſpeak always of the ſal tartari, or of the ſal alkalinus fixus vegetabilis purificatus of our Edinburgh Diſpenſatory. This ſalt, as it is in chemiſtry, ſo in medicine it might be conſidered as a ſubſtance very different from the neutral ſalts: but its operation in the human body is not ſo much different as might be imagined; for it can hardly be thrown into a human ſtomach without meeting there with as much acid as will convert it into a neutral; ſo that its operation afterwards muſt be the ſame with that of a neutral. From this view of the matter, I am uncertain how far the operation of the fixed alkali in the ſtomach may be that of a ſimple alkali, or how far it may be that of a neutral; and therefore we muſt be uncertain how far the virtues aſcribed to it by writers are to be conſidered as the effects of the one or of the other. As an alkali, it muſt in the firſt place act as an abſorbent, but its proving ſuch converts it into a neutral; ſo that its laxative and diuretic effects may entirely depend upon its being in this ſtate. Its laxative powers have been commended, but I have never found them to be conſiderable; and I ſhould never think of exhibiting them with this intention.

THE diuretic effects of the fixed alkali we have frequently experienced; and if we have been alſo very frequently diſappointed in this, we are not ready to conclude a want of power in the medicine. There is a great uncertainty in determining to the kidneys; and from this we are often diſappointed in the effects of powerful diuretics. With reſpect to the fixed alkali, I muſt obſerve, as I have often done in practice, that I have never found it powerfully diuretic but when it is thrown in in large quantities.

ON this ſubject of the fixed alkali, beſides its laxative and diuretic powers, there is another aſcribed to it, which I think it neceſſary to take notice of; and that is, its power of diſſolving the fluids, or the concretions which may happen to be formed in them, which the French writers expreſs by the term of *Fondant*. Either for the ſuppoſing of this power, or of its effects, I can find no good foundation. I will not deny its having ſome power in this way; but, as I obſerved above, this in the mild alkali is very ſmall; and though, in its cauſtic ſtate, it may be ſufficiently powerful, this, in any quantity that can be introduced into the body, cannot poſſibly have any effect upon the quantity of fluids to which it is applied, and eſpecially when it is conſidered how much of it muſt be withdrawn by the acids of the ſtomach. How much therefore, whether good or bad, may have been ſaid of the ſolvent power of alkalines in the maſs of blood, we hold it to be truly none at all.

AFTER the fixed alkali, I am to ſpeak of the incomplete neutral.

TARTAR.

THIS, in its rude ſtate, may perhaps be employed; but we are acquainted with it only in its refined ſtate, when it is named the *Cryſtals*, or *Cream*, of *Tartar*.

THIS conſiſts, for a great part, of the vegetable fixed alkali, ſuperſaturated with a quantity of an acid which, though in the main, of the nature of the vegetable acid, has however ſomething peculiar, which to me is not well aſcertained; but in the mean time, the conſideration of it does not ſeem neceſſary in any application of it to the purpoſes of medicine.

THIS ſubject, the cryſtals of tartar, has long been employed as a laxative and gentle cathartic, and may be given from one dram to two ounces, according to the conſtitution of the perſon to whom it is given, and to the operation intended by it. Under half an ounce, it is commonly a laxative only of moderate power; but given to an ounce or upwards, it often acts as a powerful purgative.

TAKEN in a moderate doſe, in evacuating the inteſtines, and in producing all the effects of that, it has all the powers of the neutral ſalts, and is as uſeful an antiphlogiſtic as any we can employ. In large doſes, however, without any inflammatory ſtimulus applied to the inteſtines, it acts like a purgative in exciting the action of the abſorbents in every part of the ſyſtem, and that more powerfully than happens from the operation of any entirely neutral ſalt. I need hardly ſay, that upon this operation of exciting the abſorbents, is chiefly founded the late frequent uſe of the cryſtals of tartar in the cure of dropſy.

WHEN the cryſtals of tartar are thrown into the body in ſuch quantities as to operate little by ſtool, they paſs more readily into the blood-veſſels; and even when thrown into the ſtomach more largely, they ſometimes take the ſame courſe. In both caſes they paſs to the urinary paſſages, and promote the ſecretion of urine ſometimes very copiouſly. I have, however, been frequently diſappointed of their diuretic effects; and it is proper to be remarked by practitioners, that they do not readily take their courſe to the kidneys unleſs they are accompanied by a quantity of water, or watery fluid, thrown in at the ſame time: and therefore, as Dr HOME has taught us, they are moſt properly given in a liquid form.

SALES NEUTRI.

THESE are the laxatives or gentle cathartics moſt generally employed. As they do all that can be effected by an evacuation from the inteſtines, without acting ſtrongly upon the moving fibres, they give no ſtimulus, or at leaſt no inflammatory ſtimulus, to the whole ſyſtem, and are therefore moſt uſefully employed when any phlogiſtic diatheſis prevails in it.

THE whole of the neutral ſalts may be employed for theſe purpoſes, but ſome of them more conveniently than the others.

THAT formed of the fixed acid of vitriol with the vegetable fixed alkali, from its being of difficult ſolution, is not a convenient medicine; but if the neutral be formed of the ſulphureous, or volatile vitriolic acid, when it comes under the title of Sal Polychreſtus, this, to perſons who can bear its odour, taken from one dram to four, proves a very convenient laxative. But I muſt remark here, that thoſe apothecaries miſtake the matter much who take the reſiduum of the diſtillation of GLAUBER's acid of nitre for the ſal polychreſtus.

THE vitriolic acid with the foſſil alkali, gives the neutral named GLAUBER's Salt, in very frequent uſe; and which indeed, on every occaſion, ſerves the purpoſe of the neutrals.

IT is now well known, that ſuch a neutral may be made of the vitriolic acid with either the foſſil alkali or with magneſia alba; and from every obſervation I can make, there ſeems to be no difference in the two compoſitions for all the purpoſes of a neutral ſalt.

THE nitrous acid with either of the alkalines gives laxative neutrals; but they are not conveniently employed in practice, becauſe the quantity that is neceſſary to be a laxative doſe is commonly very diſagreeable to the ſtomach.

THE muriatic acid gives neutrals which may be employed when largely diluted; but to moſt perſons the ſalt taſte is diſagreeable, and large doſes are ready to excite an uneaſy thirſt, that continues after the operation of the ſalt is over.

THE vegetable acids, either native or fermented, give neutrals that may be employed; but they are not very powerful, and therefore ſeldom conveniently uſed as laxatives.

IT is the acid of tartar that gives ſome of the moſt convenient laxatives; and they are prepared by ſaturating the cryſtals with the quantity of alkali neceſſary to render the whole exactly neutral. For this purpoſe, either the fixed vegetable or foſſil alkali may be employed. The former gives the tartarum ſolubile, or alkali tartariſatum; and the latter gives the ſal Rupellenſis, or natrum tartariſatum. The tartarum ſolubile is not eaſily brought into a cryſtalline ſtate, or kept in a dry form; whilſt the ſal Rupellenſis has not either of theſe diſadvantages. It is of a leſs diſagreeable taſte than almoſt any other neutral; and as anſwering every purpoſe for which theſe can be required, I expect it will come to be very generally employed. As the acid of tartar is of a weaker attraction than almoſt any other acid, ſo it may be often diſlodged by the acid of the ſtomach, and this often renders the operation of the tartarum ſolubile leſs certain, as the combination of the alkali with the acid of the ſtomach is a leſs powerful laxative; but the ſal rupellenſis is not liable to this diſadvantage, as the acid of the ſtomach combined with the foſſil alkali is ſtill a tolerably powerful laxative.

UNDER this title of the neutral laxatives, it is proper to mention the magneſia alba, which I have inſerted into my catalogue. It is an earthy ſubſtance, of itſelf inert; but meeting with acids in the ſtomach, has the ſame operation with neutrals. It is not neceſſary to ſay any thing here of its preparation or adminiſtration, as both are now commonly well underſtood.

AFTER the neutrals I have ſet down the ſaline mineral waters, which are certainly to be reckoned amongſt the laxantia, and are indeed often employed as ſuch with all the effects of the artificial neutrals. To render my work complete, I ſhould have treated of theſe mineral waters; but neither my leiſure, nor the ſize to which my work muſt be confined, could admit of ſuch a treatiſe: and it did not ſeem neceſſary, as there are ſome very good works on the ſubject in every body's hands. I muſt not however diſmiſs the ſubject without one obſervation.

MANY mineral waters have more effect as laxatives than might be expected from the quantity of ſaline matter they contain; which ſhows, that a quantity of water accompanying theſe ſalts contributes to their operation; which leads to this leſſon, that the artificial neutral ſalts may have their powers and effects always improved by being exhibited with a large quantity of water.

I HAVE now mentioned the ſeveral ſubſtances which, by the degree of force they commonly exert, as well as by the nature of their operation, are intitled ſtrictly to the appellation of Laxatives; and I might now proceed to conſider thoſe ſubſtances which may be as ſtrictly named the Purgatives. But I have ſet down in my Catalogue ſeveral ſubſtances that will not properly arrange under either title, or ſuch as I am uncertain whether to refer to the one or to the other, but which muſt not be kept entirely out of the ſight of the practitioner.

OF theſe, which by the force they exert may be conſidered as laxatives, though their manner of operating be very different, I would mention the *olea blanda*, whether obtained by expreſſion from vegetables, or in the form of butter from the milk of animals.

THESE, I have ſaid, enter into the compoſition of the chyle and animal fluid: but this happens when taken in to a certain quantity only; for if that is greater than can be properly united with the other fluids, a part of ſuch oil muſt remain and paſs along the inteſtines in its ſeparate ſtate. In this ſtate it appears, from experience, that it contributes to promote the evacuation by ſtool. How it does this I am not ready to explain; but its doing ſo was enough for me to give theſe oils a place in my catalogue. I knew a perſon who frequently required a laxative, and the laxative commonly employed was from half an ounce to an ounce of the pulp of caſſia, with an ounce of the oil of ſweet almonds; but on ſeveral occaſions, it was found that the pulp would not anſwer the purpoſe without the oils being at the ſame time employed. In another inſtance, I have had occaſion to obſerve the laxative power of oily matters. A perſon was adviſed to take as a medicine, every morning, four ounces of freſh butter; and the effect was conſtantly to give a ſtool or two more than uſual.

AFTER theſe oily matters, I chooſe to mention what has ſome affinity with theſe, the *ſapo albus hiſpanus*, or the purer kinds of white ſoap.

THIS I have ſet down in my catalogue in complaiſance to the general opinion; but, in my own, its power is never conſiderable; and when it does appear, it is upon a ground that practitioners do not commonly apprehend. I have had many inſtances of perſons taking this ſoap to half an ounce or more every day, without its ſhowing laxative effects; and though it does upon many occaſions ſhow theſe, it may I think be a queſtion, by what quality it operates? If the pureſt ſoap be diſſolved, as it may readily be in rectified ſpirit of wine, the ſalt commonly intermixed with the ſoap is left undiſſolved, and the diſſolved ſoap, by a proper evaporation, may be recovered in a dry form.

IN this ſtate the ſoap is mild and inſipid; and in my opinion cannot give any irritation to the inteſtines, or to any other the moſt ſenſible part of the body.

WE preſume therefore that ſoap is not a laxative; and if ever it appears to be ſo, this I think muſt be aſcribed to the common ſalt, which, from the circumſtances of the manufacture it always contains, I formerly gave a ſtricture with reſpect to the uſe of ſoap in glyſters, and I have now another obſervation to offer. If ſoap, upon any occaſion, come to be employed in nephralgic caſes, and, by proving laxative, ſhould thereby limit the uſe of it more than might be deſired, the correction will be eaſy. The ſoap, by the proceſs above mentioned, may be deprived of its common ſalt, and ſtill remain as fit for the cure of the nephralgia as ever, and more uſeful perhaps, as it may then be taken in much larger quantity than before.

Two other ſubſtances yet remain to be mentioned as laxatives; which, by their degree of power, will from every body obtain that appellation, though their manner of operating may be different.

Sulphur.

I am not here to attempt the chemical hiſtory of this ſubſtance, becauſe I can hardly make application of its various chemical treatment to the purpoſes of medicine. Many of the preparations of ſulphur promiſe to be active with reſpect to the human body, and they undoubtedly are ſo; but the virtues that have been aſcribed to them ſeem to me to be very uncertain; and I have not been able, either from experience or reflection, to aſcertain their proper uſe: and, in the mean time, I conſider all powerful ſtimulants, that are not directed by a nice and ſcientific choice, to be in the hands of the moſt part of practitioners more frequently miſchievous than uſeful. I do not judge myſelf ſkilful enough to direct in this matter, and therefore avoid the ſubject; and I have introduced the title of ſulphur here to conſider it merely as a laxative. In this view, from half a dram to a dram of the flores ſulphuris will ſeldom fail to give one ſtool, and will ſeldom give more. It has this operation without heating the body, and for the moſt part without griping the bowels. Theſe circumſtances render it a moſt proper and convenient laxative; and were it not for the fætor that ſometimes attends its operation, and is ready to be diffuſed in the air around, ſulphur would be one of the moſt agreeable laxatives that could be employed. As ſulphur is not obviouſly ſoluble in the animal fluids, there is ſome difficulty in accounting for its operation; but however we may account for it, this is certain, that a laxative quality is in ſome meaſure extracted from it: and I would make this uſe of its being ſlowly diſſolved to allege, that it paſſes through a great length of the inteſtines with little action upon them, and at length acts only upon the great guts. This explains to me both its moderate operation and its particular and frequently obſerved effect in relieving hæmorrhoidal affections.

SINAPI ALBUM *vel* NIGRUM.

THOUGH I have touched this ſubject before, to give it more fully and clearly I muſt repeat a little.

THIS ſeed is employed as a laxative in a peculiar manner. In its powdered ſtate it has laxative qualities; but it cannot be employed in the quantity neceſſary as a laxative without irritating the ſtomach very much, and even occaſioning vomiting. It cannot therefore in powder be employed as a laxative but by taking the ſeed in its entire and unbruiſed ſtate; and by ſwallowing it in this ſtate to a certain quantity, it ſeldom fails to prove laxative. Generally a table ſpoonful, or about half an ounce in weight, is the doſe which, taken once a-day, keeps the belly regular, that is, produces one natural ſtool every day. Sometimes, however, this is not enough; and for the purpoſe the doſe muſt either be increaſed, or that mentioned muſt be taken twice a-day.

WITH reſpect to this, it has been apprehended that the ſeed taken, might be broken down in the ſtomach, and therefore in large quantity prove a dangerous doſe; but I believe there is no ground for this, as I am perſuaded that the ſeed is never broken down in the ſtomach, and I have known it to appear entire in the ſtools. I once knew a paralytic woman into whom more than four ounces of muſtard ſeed had been ſucceſſively thrown, without any evacuation by ſtool having happened in the mean time. This however was afterwards produced, when the muſtard ſeed came away ſeemingly in the ſame quantity, and in the ſame entire ſtate, in which it had been taken in.

THOUGH from theſe accounts it appears that this ſeed is not broken down or diſſolved in the ſtomach, yet from other circumſtances it is certain, that in the ſtomach or inteſtines it gives out ſome portion of its ſubſtance. That it gives a ſtimulus to the ſyſtem appears clearly from BERGIUS finding it to be uſeful in intermittent fevers. It is commonly alleged by our practitioners to be uſeful in palſy and chronic rheumatiſm; and its operation in the urinary paſſages is commonly evident by its promoting the ſecretion of urine.

Two other ſubſtances are ſet down under the title of Cathartica Mitiora; but whether to be conſidered as laxantia ſtricte dicta, we dare not determine.

AMARA.

THE effect of theſe as laxatives, and even as purgatives interrupting the uſe of them in the cure of intermittent fevers, we have taken notice of above; but it ſeems ſtill proper to inſert them in our liſt of cathartics here.

THEY are ſeldom employed for this purpoſe alone; but I have known a ſtrong infuſion of chamomile, or a dram of the powder, employed with ſucceſs: and I have frequently found that when ſenna was infuſed in the infuſum amarum, a leſs quantity of the ſenna was neceſſary for a doſe than in the ſimple infuſions of it.

NEXT to the amara I have ſet down the Bilis Animalium; and the analogy is from ſeveral conſiderations ſpecious: but I muſt own, that without my being able to perceive the cauſe of it, I have never found the management that was neceſſary to render this bile a proper laxative. In its dried ſtate I have given pretty large doſes of it without any effect.

Balsamica.

Here is an article which I have treated of before; but I ſtill thought it proper to give it the place here which it certainly ought to have among the Cathartica. It does not however appear to be neceſſary to repeat here what my readers can ſo eaſily take from the articles of Turpentine, Balſamum Capivi, and Guaiacum, relative to the laxative, or if you will, the purgative powers of theſe ſubſtances.

II. CATHARTICA ACRIORA, sive PURGANTIA.

The diſtinction of theſe from the laxantia, not only by their degree of power, but eſpecially by the nature of the ſtimulus they give to the inteſtines, I have explained above.

The ſtimulus of purgatives has been ſuppoſed ſpecific with reſpect to the inteſtines, and particularly as thus diſtinguiſhed from emetics. This, with reſpect to the ſpecific nature of both emetics and purgatives, has been concluded from this, that theſe medicines, upon being injected into the blood-veſſels of a living animal, have commonly operated by occaſioning a vomiting or purging; but this does not imply more than that theſe organs are liable to be affected by any general diſorder of the ſyſtem: and that it depends upon any ſpecific power in theſe ſubſtances, is contradicted by many other experiments.

It is well known that every emetic, under a certain management, can be rendered a cathartic, and every cathartic of a ſtronger kind, or in a larger doſe, is ready to act as an emetic. If a difference appears in their operation, it ſeems to me that it is a firſt application, and a greater ſolubility, that renders medicines more conſtantly emetic. That the ſtimulus of theſe medicines is not ſpecific, appears clearly from hence, that they are ſtimulant of every excretory to which they are applied; and we have frequent inſtances of their acting readily as errhines when applied to the noſe.

THE ſtimulus of purgatives has been commonly ſuppoſed to reſide in their reſinous parts; but a compariſon of a few particulars will ſhow this to be a miſtake.

BEFORE entering upon my Catalogue of the Cathartica acriora, I muſt obſerve, that there are two or three articles which I judge to be properly belonging to the order of purgantia, though I have inſerted them in the liſt of the laxantia.

THESE are the articles of Roſa, Viola, and Polypodium, which, by the moderate power of their operation, have been conſidered as laxatives. But if there is any foundation for the diſtinction I have eſtabliſhed, it will readily appear that the ſubſtances juſt now mentioned have nothing in their conſtitution that can lead us to conſider them as laxantia ſtricte dicta. They are certainly of the nature of purgatives, and ſhould have been taken into the liſt of this order: but as I did not take notice of them in their place, I muſt now ſay of them, that their force is ſo inconſiderable that they do not deſerve our attention now, and that they might be entirely neglected in practice.

ALOE.

THIS is a medicine the moſt frequently employed, and from the gentleneſs of its operation, as commonly employed, it might be conſidered as a laxative; but by the nature of its ſtimulus, which often appears, it is undoubtedly a purgative.

THERE are two ſpecies of the aloes in uſe; one named the *Socotorine*; the other commonly named the *Hepatic*, but more properly by the place from whence it is the moſt frequently imported, *Barbadenſis*.

THESE two ſpecies are ſuppoſed to be ſomewhat different in their qualities, and the former generally ſuppoſed to be the more excellent. It is certainly a purer ſubſtance, of more agreeable flavour, and giving more elegant tinctures; but whether for medicinal uſe it has any more valuable quality, may, I think, be doubted. Both the ſpecies are nearly of the ſame conſtitution, the proportion of reſinous and gummy parts being nearly the ſame in each; and although there was ſome difference in theſe reſpects, it does not appear to be well determined what difference that would make in the medicinal qualities.

WHEN the London College formerly preſcribed the ſeparation of the reſin and gum of aloes, they ſeem to have thought the virtue of theſe two parts to be conſiderably different; but by their omitting this preparation in their laſt edition, they ſeem to have changed their mind. I do not indeed know of any experiments which clearly determine this matter; and what is more, I do not know of any deciſive experiments which eſtabliſh the excellency of the Socotorine aloes above that of Barbadoes.

I FORMERLY practiſed at Glaſgow, at the port of which the Barbadoes aloes is chiefly imported, and where, therefore, I had occaſion to ſee it much employed; but I do not remember any inſtances of its failing of the effects commonly expected from aloetic medicines. By the beſt information I can get, our apothecaries at preſent, though they employ the Socotorine for their tinctures, yet whenever aloes is to be employed in a ſolid form, they conſtantly employ the Barbadenſis; and I doubt if any practitioner complains of the change that is put upon his preſcription. But paſſing this diſpute about the two ſpecies, I proceed to mention the effects to be expected from the one or the other, and ſhall ſpeak of them under the general title of Aloes.

THIS is chiefly employed merely as a medicine to keep the belly regular; and it hardly ever does more than produce one ſtool, which ſeems to be merely an evacuation of what may be ſuppoſed to have been preſent for the time in the great inteſtines. It is remarkable that it does this in a very ſmall doſe. I have known innumerable inſtances of perſons who very conſtantly obtained this effect from one or two grains of aloes; and it is equally remarkable, that though the doſe is increaſed to ten times the quantity, the effect is much the ſame. I have found that hardly any doſe under twenty grains will procure a liquid ſtool, and when it happens, it is always with pain and griping; from whence we conclude, that though aloes is more fit than any other laxative or purgative for diſcharging the preſent contents of the inteſtines, it is never a medicine fit for producing any large or liquid evacuation.

WITH reſpect to its ordinary operation, Dr LEWIS has alleged that its effects are more permanent than thoſe of any other purgative: but this we can hardly admit of; for we commonly find, that notwithſtanding the uſe of aloes, the ſtate of coſtiveneſs will return at its uſual period, and that it is often neceſſary to anticipate this by the uſe of the aloetic.

UPON this ſubject of the employment of aloes, two reflections are to be made: One is, that as aloes does not procure liquid ſtools, and diſcharges only the contents of the great inteſtines, it is probable, that though, from cauſes not well underſtood, it acts hardly upon the ſmaller inteſtines, and almoſt only upon the greater; and which may alſo be preſumed from the ſlowneſs of its operation, which is hardly in leſs than ten or twelve hours after its exhibition.

FROM this my ſecond reflection ariſes, and is, that as aloes operates eſpecially upon the inteſtinum rectum, there may be a foundation for the common opinion of its producing hæmorrhoidal affections; and from the large and frequent uſe of aloes, I have had inſtances of ſuch effects: but we muſt at the ſame time obſerve, that from the moderate uſe, it is not a frequent accident, and does not lead to that nicety which ſome practitioners expreſs with reſpect to the uſe of aloes. I have known inſtances of its ſafety even in hæmorrhoidal perſons; and I am perſuaded that hæmorrhoidal affections are produced by a coſtive habit, and its circumſtances above explained, much more frequently than by the uſe of aloes.

AFTER mentioning theſe operations of aloes in the inteſtines, we would inquire after its operation in the blood-veſſels; and it has been a common opinion that it diſſolves or increaſes the fluidity of the whole maſs: and Dr LEWIS alleges that this appears in the blood drawn from perſons uſing aloetics. This, however, appears to me improbable. We have frequently ſeen the blood drawn from perſons uſing a good deal of aloes, and never could diſcover any change of its conſiſtence; and if we can truſt to the experiments of SCHWENKE, aloes added to the blood drawn out of the veins ſeems to coagulate rather than to diſſolve it: and whatever may be in this, I would maintain that the quantity of aloes taken in, can hardly have any ſenſible effect on the whole maſs of blood.

THE common opinion, however, has prevailed; and it is alleged, that by its diſſolving power it proves an emmenagogue, and is hurtful in all morbid hæmorrhagies. Of the latter, however, I have no experience; and muſt ſay farther, that I have ſeldom found the emmenagogue powers of this ſubſtance. If ever there be any appearance of ſuch a power, it is probably to be aſcribed rather to its operation on the rectum, communicating a ſtimulus to the veſſels of the uterus, than to its action on the maſs of blood.

ON the operation of aloes, I have only further to add, that even when it is not to act as a purgative, it has an action upon the ſtomach. As it is a bitter, this will be readily admitted; and I have frequently found it to be an antiſpaſmodic, in relieving pains of this organ.

THESE are the operations of aloes, and I am next to ſpeak of the forms in which it is employed: And my firſt obſervation is, that aloes acts as readily in ſubſtance as in any ſolution, and therefore this is never to be practiſed but for the ſake of more convenient exhibition: and we have commonly found it operate in ſubſtance in a ſmaller doſe than in the vinum aloeticum. It is remarkable that aloes hardly receives improvement by any addition; and our vulgar find as much effect from the aloes alone as from the pilulæ aloeticæ. We are however of opinion, that ſome benefit is obtained by ſome diviſion of the aloes before it is taken into the body, and that the extract of gentian is properly enough employed; but I am perſuaded that the Edinburgh College have not done rightly in withdrawing the whole of the ſal polychreſtus from the aloetic pill.

In the pilulæ rufi the myrrh may be uſeful in dividing the aloes; but we hold the addition of the ſaffron to be inſignificant: and we are certain that though this is added, the pilulæ rufi, in the ſame quantity, never does more than the aloetic pill.

Several practitioners have thought of adding rhubarb to aloes, but to no good purpoſe that I can perceive. Aloes, as we have ſaid, operates in a very ſmall doſe; but rhubarb hardly ever does; and therefore, in the pilulæ ſtomachicæ Ph. Ed. the rhubarb ſeems to be an uſeleſs addition: and I can aſſert from experience, that theſe pills never act but in proportion to the aloes they contain, and never more ſtrongly or certainly than the ſame quantity of aloes taken in the aloetic pill. We are of opinion alſo that the rhubarb in the elixir ſacrum is an uſeleſs addition; and I know from experience, that a brandy tincture of aloes, to which ſome aromatic is added, does as much as can be expected or is ever obtained from the elixir ſacrum.

We are of opinion that the aloes is never properly joined with the draſtic purgatives, as is done in the pilulæ colocynthide cum aloe, and in the extractum colcynthides compoſitum: for if ſuch a medicine is intended to produce a liquid evacuation, the aloes is ſuperfluous; and if it is intended only to open the belly, the draſtics are unneceſſary.

The only aloetic I have now to remark upon is the noted elixir proprietatis, introduced from a very bad authority; and the firſt remark I have to offer is, that the ſaffron is an inſignificant ingredient; and another remark to be made is, that upon account of the menſtruum employed by the Edinburgh College, I have never thought of employing it as an evacuant: but I have employed it often with ſucceſs in curing ſpaſmodic pains of the ſtomach: and for ſuiting it better to this purpoſe, the Edinburgh College ſeem to have improved it much, by the menſtruum they have employed in their elixir aloes vitriolicum.

RHABARBARUM.

MUCH pains has been taken to aſcertain the ſpecies of this genus that gives the root which the phyſicians of Britain have conſidered as the ſpecies of greateſt value, and ſuch as has been imported under the name of Turkey Rhubarb. Whether this may be exactly determined or not, I cannot clearly judge; and in the mean time, I do not think it neceſſary to proſecute the matter farther with any anxiety, as we have now got the ſeeds of a plant whoſe roots, cultivated in this country, ſhow all the properties of what we conſidered as the moſt genuine and valuable rhubarb; and which, properly cultivated and dried, will, I believe, in time ſuperſede the importation of any other.

THE qualities of this root are that of a gentle purgative; and ſo gentle that it is often inconvenient, by reaſon of the bulk of the doſe required, which in adults muſt be from half a dram to a dram. When given in a large doſe it will occaſion ſome griping, as other purgatives do; but it is hardly ever heating to the ſyſtem, or ſhows the other effects of the more draſtic purgatives.

THE purgative quality is accompanied with a bitterneſs, which is often uſeful in reſtoring the tone of the ſtomach when it has been loſt; and for the moſt part its bitterneſs makes it ſit better on the ſtomach than many other purgatives do. Its operation joins well with that of the neutral laxatives; and both together operate in a leſſer doſe than either of them would do ſingly.

SOME degree of ſtypticity is always evident in this medicine; and as this quality acts when that of the purgative has ceaſed, ſo in caſes of diarrhœa, when any evacuation is proper, rhubarb has been conſidered as the moſt proper means to be employed. I muſt however remark here, that in many caſes of diarrhœa no further evacuation than what is occaſioned by the diſeaſe is neceſſary or proper, and therefore the vulgar practice of employing rhubarb in every caſe of this diſeaſe, appears to me to be very injudicious.

THE uſe of it however in many caſes of diarrhœa may be proper; but analogy has by a groſs miſtake transferred it to the caſe of dyſentery, to which its purgative quality is not well ſuited, as a large and improper doſe of it is neceſſary; and its aſtringent quality, if it takes place, muſt certainly be hurtful.

THE uſe of rhubarb in ſubſtance, for keeping the belly regular, for which it is frequently employed, is by no means proper, as the aſtringent quality is ready to undo what the purgative had done; but I have found that the purpoſe mentioned may be obtained by it, if the rhubarb is chewed in the mouth, and no more is ſwallowed than what the ſaliva has diſſolved. In that caſe it appears to me that the aſtringent quality is not largely extracted, and therefore the cathartic will operate as required: and I muſt remark, that in this way employed, it is very uſeful to dyſpeptic perſons. Analogous to this is the uſe of rhubarb in ſolution; in which it appears to me that the aſtringent

ſtringent quality is not ſo largely extracted as to operate ſo powerfully as when the rhubarb was employed in ſubſtance.

Water extracts the purgative quality of rhubarb very readily, but does not extract it ſo powerfully as to allow the doſe to come into a ſmall bulk; and therefore the infuſion in water is chiefly adapted to the uſe of children. Wine hardly extracts it more powerfully; and both Colleges have given up the uſe of this menſtruum. The only uſeful ſolution is that made by brandy, which, if the taſte can be reconciled to it, is rendered better by the bitters added in the tinctura rhei amara, Ph. Ed.; but the bitters will hardly make up for the rhubarb being in leſſer proportion than in the tinctura rhei dulcis.

For the uſe of rhubarb joined with aloes, either in a liquid or in a ſolid form, I have ſaid enough above in the article of aloes: and here, to the young practitioner I would remark, that the doſe of rhubarb is for the moſt part too bulky to come into the form of pills.

The uſe of rhubarb in the alimentary canal, as a purgative, a bitter, and in ſome circumſtances as an aſtringent, may be underſtood from what has been ſaid; and whether its operation in other parts of the ſyſtem is to be mentioned, ſeems doubtful.

By its colouring the urine, it appears to paſs in part by the kidneys; but I have not perceived it to have any particular effect there: and particularly, though I have often attended to it, I could never find that it promoted in any degree the ſecretion of urine.

It has been ſaid to operate upon the liver, and to be uſeful in jaundice: but I cannot find any foundation for this either in theory or practice; and I believe the opinion has ariſen entirely from the ridiculous doctrine of ſignatures.

It has been ſuppoſed that rhubarb may be a tonic with reſpect to the whole ſyſtem, or to particular parts of it; and accordingly it has been alleged to have been uſeful in diabetes; but our experiments here do not at all confirm this.

It has been alſo repreſented as uſeful in the fluor albus; but we have had no experience in confirmation of this, and cannot find it probable that the quantities employed ſhould, either by their tonic or aſtringent power, be of any ſervice.

POLYGALA SENEKA.

This is a medicine introduced about ſixty years ago; and as a new medicine, was then much commended for its great and ſingular power: but the eſteem of it has ſince fallen very much. I have put it into the catalogue of purgatives, as this is the only operation of it that is conſtantly very evident; and perhaps all its other virtues depend upon this. Some difference is alleged to be between the bark and the woody part of this root, and the latter is alleged to be quite inert. We believe this to be well founded; but the ſize of the root, as imported into this country, has not allowed us to attend to this; and in the ſmaller twigs we have conſtantly taken the two parts together.

It has been employed in powder, in a wine infuſion, and in decoction with water; and the laſt is the moſt frequently in uſe. The powder may be given from twenty to forty grains as a purgative; but it is very ready to excite vomiting, and thereby prevent its purgative operation; which has occaſioned the decoction to be moſt frequently uſed. This is made by boiling an ounce of the root in a pound and a half of water till it is reduced to a pound; and of this a table-ſpoonful or two is given every hour till it operates by ſtool: This it commonly does after ſix or ſeven doſes; producing three, four, or more ſtools; and this operation is repeated every day, or every ſecond day, till the diſeaſe is cured. It frequently, at the ſame time with its purgative, ſhows its diuretic effects; and frequently, when large doſes can be admitted, it excites a very free ſweat.

THIS medicine was at firſt introduced as a cure for the bite of the rattle-ſnake, and by a ſuppoſed analogy was propoſed as a remedy for pleuriſy and peripneumony. It was accordingly for ſome time very much employed in America; and for its good effects in theſe diſeaſes, we had from America, France, and other countries, many ſtrong teſtimonies; but of late theſe have not been repeated, and I never knew of any inſtances in this country in which it ſucceeded, or indeed of its being truſted to without blood-letting. With reſpect to the uſe of it at preſent in France, it may be obſerved, that Mr LIEUTAUD, on the ſubject of the inflammatio pectoris, has not once mentioned its uſe; and in his ſecond volume, where he was obliged to mention it as an article of the materia medica, he has the following paragraph: "*A nonnullis primi ſubſellii laudatur* in cachexia et hydrope; nec "deſunt qui illam pro egregio reſolvente in pulmonum phlogoſi "deprædicent, *penes quos ſit fides*."

The analogy from its ſuppoſed powers in inflammatory diſeaſes has occaſioned its being employed in rheumatiſm; and we have had ſome inſtances of its being uſeful, eſpecially where it operated by producing ſweat.

MR BOUVART of the Academy of Sciences found the ſeneka to be a cure of dropſy, and we have had ſeveral inſtances of its efficacy when employed ſo, as in the manner above mentioned, to operate both by ſtool and urine; but it has alſo in many inſtances failed: and as a nauſeous medicine, which the ſtomach does not eaſily bear in the neceſſary quantity, it has not been often employed.

GENISTA.

THOUGH very little in uſe, I have inſerted this in my Catalogue from my own experience of it. I found it firſt in uſe among our common people; but I have ſince preſcribed it to ſome of my patients in the manner following: I order half an ounce of freſh broom tops to be boiled in a pound of water till one half of this is conſumed, and of this decoction I give two table-ſpoonfuls every hour, till it operates by ſtool, or till the whole is taken. It ſeldom fails to operate both by ſtool and urine; and by repeating this exhibition every day, or every ſecond day, ſome dropſies have been cured.

THE cineres geniſtæ, though employed by SYDENHAM and many others, have no advantage over other fixed alkaline ſalts.

SAMBUCUS ET EBULUS.

WE put theſe together as ſpecies of the ſame genus, and of very ſimilar virtues. I have hardly been acquainted with them in practice, but my reſpect for Dr SYDENHAM engages me to give them a place here.

HE has told us that a decoction of the middle bark of this tree operates both upwards and downwards, evacuating a great quantity of water both by ſtool and urine; and by that means he had cured many caſes of dropſy.

SOME other practitioners have recommended the ſame remedy, and I have often thought of imitating the practice, but have been prevented, by being uncertain of the doſe; Dr SYDENHAM's three handfuls being a very uncertain meaſure: and I could not truſt the ſpurious work of BOERHAAVE aſſigning the doſe more exactly, when I perceived from ſeveral accounts that the operation of this medicine muſt be in a ſtrong degree, and that it has been often carried to a dangerous exceſs.

BOTH the flowers and berries of the elder have been commended for many virtues, and I will not deny that they have ſome; but I can ſay, that in a hundred inſtances of their employment I could never diſcover their power and efficacy to be conſiderable, or indeed to deſerve any attention.

OLEUM RICINI.

THE ſeed which affords this oil may be made into an emulſion, and employed as a purgative. In this form it may be more agreeable to ſome perſons than the oil; but the doſe is not eaſily determined, the ſtate of the ſeeds, as imported from the Weſt Indies, not being uniformly the ſame. The oil, therefore, as obtained in the Weſt Indies from the ſeed by expreſſion or boiling, is the medicine we very conſtantly make uſe of, and, when the ſtomach can be reconciled to it, is one of the moſt agreeable purgatives we can employ. It has this particular advantage, that it operates ſooner after its exhibition than any other purgative I know of, as it commonly operates in two or three hours. It ſeldom gives any griping, and its operation is generally moderate, to one, two, or three ſtools only. It is particularly ſuited to caſes of coſtiveneſs, and even to caſes of ſpaſmodic cholic. In the Weſt Indies it is found to be one of the moſt certain remedies in the dry belly-ach or colica pictonum. I have never found it heating or irritating to the rectum, and therefore have found it ſufficiently well ſuited to hæmorrhoidal perſons.

THE common doſe of this oil is a table-ſpoonful or half an ounce; but many perſons require a double quantity, and there is ſeldom any harm ariſes from a little increaſe of the common doſe. It is particularly to be obſerved of this medicine, that if it be frequently repeated, the doſe of it may be gradually more and more diminiſhed; and I know inſtances of perſons who, formerly of a coſtive habit, at firſt required half an ounce or more for a doſe, but after being frequently repeated, they now find that two drams are enough at leaſt to keep their belly regular.

THE only inconvenience attending the uſe of this medicine is, that as an oil it is nauſeous to ſome perſons; and that, when the doſe is large, it occaſions ſickneſs at ſtomach for ſome time after it is taken.

To obviate theſe inconveniences, ſeveral means have been tried; but I ſhall not detail theſe here, as I can aſſert, that the moſt effectual means is the addition of a little ardent ſpirit. For this, in the Weſt Indies, they employ rum; but that I might not withdraw any part of the purgative, I employ the tinctura ſennæ compoſita, or elixir ſalutis of the Edinburgh Diſpenſatory. This, added in the proportion of one to three parts of the oil, and very intimately mixed by their being ſhaken together in a phial, both makes the oil leſs nauſeous to the taſte, and makes it ſit more eaſy on the ſtomach.

WITH reſpect to this oil, I have only one remark farther to make. As it is imported from the Weſt Indies, and eſpecially as procured there by boiling, it very readily acquires ſome degree of rancidity; but if the patient's taſte and ſtomach can, by the means above mentioned, be reconciled to it, this rancidity does not ſeem to diminiſh the purgative quality.

SENNA.

THIS is a medicine of frequent uſe in Britain, which I have been much ſurpriſed at, as it is not agreeable either in its taſte or flavour; as it muſt be always in a bulky doſe; and as it ſeldom operates without a good deal of griping. In ſpite, however, of all this, it is ſtill in frequent uſe, which ſhows me how much the moſt part of practitioners are guided by imitation and habit.

ALLOWING, however, for the faults of ſenna hinted at, we muſt ſtill admit that it is a very certain purgative, operating moderately, and ſeldom to exceſs; but with theſe latter qualities, it is ſtill a purgative only without any peculiar virtues.

IT is not conveniently employed in ſubſtance, as it muſt be in a bulky doſe, not leſs than a dram or more. It is, however, in ſubſtance, employed in ſome compoſitions, as in the electuarium lenitivum of both colleges. This too is in more frequent uſe than I would expect; but I have neither time nor patience to enter upon the criticiſm of this compoſition, which in many reſpects I think it might admit of.

THE ſenna is more conveniently employed in ſolution than in ſubſtance. It is very conveniently extracted by water, but does not bear a boiling heat, having much of its purgative quality thereby diſſipated. To render it an effectual purgative, that may operate without griping, it requires a large proportion of the menſtruum, not leſs than four ounces of water to a dram of ſenna, which makes a bulky doſe.

THE ſenna may likewiſe be properly enough extracted by a proof-ſpirit, but with the ſame difficulty of having it as a purgative in doſes of a moderate bulk. The tincture of the London College can hardly be given as a purgative, without giving a greater bulk of ardent ſpirit than moſt men can or ſhould bear. Even the tincture of the Edinburgh College, though not ſo faulty in this reſpect, is ſtill too much ſo, and would be ſtill more, were it not for the ſubſtitution of jalap for rhubarb, which has been made in the two laſt editions of their Diſpenſatory.

As ſenna, whether extracted by water or ſpirit, is ſtill liable to be a griping purgative; ſo there are almoſt always ſome aromatics added to the infuſions of it, which, though they do not always obviate the griping, are always uſeful in covering the flavour and taſte of the ſenna. What aromatics are moſt fit for every purpoſe intended, we dare not determine; but from ſome trials and compariſons we have made, it appears that, for covering the taſte and flavour, the coriander ſeeds are the moſt agreeable and the moſt effectual; but if the purpoſe is to prevent griping, it is poſſible that ſome of the warmer aromatics, as cardamoms or ginger, may be more effectual.

HELLEBORUS NIGER *ſive* MELAMPODIUM.

THE ſtate of this root is ſo uncertain and unequal in this country, that I have hardly ever employed it, or ſeen it employed,

ployed, by itſelf as a purgative; and muſt therefore leave my readers to get information concerning it from better hands.

I HAVE not found any body in this country who had ſo much faith in BACHIER's tonic pills as to take the trouble of preparing them; and therefore we know nothing of their ſingular virtues.

UPON the authority of Dr MEAD, the black hellebore has been often, and I have ſeen it often, employed as an emmenagogue; but whether from the imperfect ſtate of the medicine, from improper adminiſtration, or from other cauſes, I would not determine; but I can aſſure my readers, that in many trials I have never found the emmenagogue virtues of this medicine, nor have I met with any practitioners of this country, though often trying it, who had better ſucceſs in this reſpect; and particularly, neither in my own practice nor in that of others, have I met with one inſtance of the power of hellebore in producing hæmorrhagy.

JALAPPA.

HERE is a medicine more uniformly of the ſame condition, and of more certain efficacy. Even to the eye-ſight the entire root contains a reſinous part; and which can, in conſiderable quantity, be extracted from it by ſpirit of wine, leaving the reſiduum nearly quite inert. The reſin thus ſeparated is an acrid inflaming matter, which, thrown into the ſtomach, proves a draſtic purgative; but it is rendered milder by being divided by a triture with any hard powder before it be exhibited. It is certainly by its reſinous part that the entire jalap proves purgative, and in large doſes proves a ſtrong one; but as it is given in powder, the previous triture, by dividing the reſin, renders the entire jalap a milder medicine than the reſin taken ſeparately. It may be given to perſons not very irritable to half a dram for a doſe, but leſſer doſes will commonly anſwer; and while it very certainly operates, it is commonly without violence, and often without griping. If it be well triturated, before exhibition, with a hard powder, and the cryſtals of tartar are the fitteſt for the purpoſe, the jalap will operate in leſſer doſes than when taken by itſelf, and at the ſame time very moderately and without griping. Except when given in very large doſes, I have not found it to be heating to the ſyſtem; and if it be triturated with a hard ſugar, it becomes, in moderate doſes, a ſafe medicine for children, which in this form they will readily receive, as the jalap of itſelf has very little taſte.

WHILE jalap may be thus rendered mild and ſafe, it may, however, by being given in large doſes, and eſpecially by being joined with Calomel, be rendered one of the moſt powerful purgatives, either as a hydragogue or as an anthelmintic, and, if we miſtake not, with more ſafety than any of the other draſtic purgatives.

HITHERTO I have ſpoken of the jalap as exhibited in a ſolid form, but it may be conveniently brought into a liquid. It does not give out its purgative quality to water, which renders it therefore of no uſe in watery infuſions: but it is very properly extracted by a proof-ſpirit: and as this does not extract the reſinous part by itſelf, and only as mixed with, and diffuſed in the gummy part, the brandy tincture proves a tolerably mild medicine. Rendered more agreeable by the addition of a little ſyrup, I have known it frequently given to children with great ſafety; and if I am rightly informed, it was the purgative employed by the inoculators, who got their inſtructions from SUTTON.

WE recommended above the tinctura ſennæ compoſita for certain purpoſes, to be mixed with the oleum ricini; but we muſt now obſerve, that the tinctura jalappæ is equally, and perhaps more, fit for the ſame purpoſes.

SCAMMONIUM.

THIS is a medicine which is offered to us in very different conditions, inſomuch that I have known different parcels of it at the difference of 200 per cent. in their prices. This muſt be owing to its frequent adulteration; and as we cannot ſuppoſe that our apothecaries are always on their guard againſt this, the practitioners of this country have not employed this medicine ſo much as to allow me properly to report its effects. When it is genuine, it ſeems to be an uſeful purgative; and though operating in a ſmall doſe, it does not ſeem to be in proportion violent. With reſpect to the manner of uſing it, as in its compoſition it has a conſiderable portion of reſin, upon which its purgative qualities ſeem to depend, it may certainly be rendered milder by being triturated with ſugar, or cryſtals of tartar, as ordered in the Diſpenſatories: but in any form it does not ſeem to have any advantage over the jalap; and I am perſuaded that, either by itſelf or in compoſition, it will never come much into the practice of this country.

RHAMNUS CATHARTICUS.

THE berries of this ſhrub are the only part of it employed, and they may be employed in various ſtates; but the only one known to us, is that of the juice made into a ſyrup, as ordered in the Diſpenſatories. In this ſtate they are powerful purgatives: and, as both griping to the bowels, and heating to the ſyſtem, they may be conſidered as of the draſtic kind, and accordingly they have been frequently employed as hydragogues. In moderate doſes they have been employed by our vulgar as a common purgative; but the ſtate of the medicine, with the hazard of its violence and griping, will prevent their being uſed by refined practitioners.

As, however, the violence and griping of this medicine can be commonly prevented, by drinking largely, during its operation, of any mild liquid, I have known it frequently uſed by perſons drinking goat-whey.

Gambogia.

This is a powerful purgative, and has accordingly been long conſidered as a chief hydragogue. For this purpoſe, however, it muſt be employed in a large doſe, when it commonly works with violence both upwards and downwards. Upon account of this violent operation, we have ſeldom employed it by itſelf, but have found, that in a few grains it might be uſefully and ſafely added to doſes of jalap and calomel.

In this manner I formerly practiſed with gamboge; but of late I have thought of uſing it by itſelf in the following manner. Obſerving that it was a purgative which paſſed through the inteſtines more quickly than almoſt any other, I have judged that moderate doſes of it might be repeated ſoon after one another with more ſafety, and with more effect, than by giving large doſes at once. Accordingly, I have given doſes of three or four grains rubbed with a little ſugar; and repeating theſe every three hours, I have found it operate without vomiting or griping: and at the ſame time, after three or four ſuch exhibitions, a great deal of water was evacuated both by ſtool and urine.

Although I have not yet had much experience of this management, I have no doubt of its being adapted to the cure of dropſy with more eaſe to the patient than in any other manner of exhibiting it.

For a long time paſt the gamboge has been famous over Europe as the fitteſt and moſt effectual medicine for expelling the tænia or tape-worm. Of this power I have had few opportunities, from experience, that could enable me to make any uſeful obſervations upon it; and I judge it beſt to refer my readers to Profeſſor Murray's Apparatus Medicaminum for the moſt full and accurate information on this ſubject.

To render my catalogue of purgatives complete, I have inſerted here two articles, Nicotiana and Veratrum. Of the former article, and particularly of its purgative powers, as thrown into the rectum, I have treated already; and of the latter I ſhall ſay a little here.

Veratrum.

The London College, in the edition of their Diſpenſatory for 1746, as an officinal medicine, gave a tincture of this root, but they have omitted it in their laſt edition; and I am not ſurpriſed at this, as it is a very poiſonous plant, which I would hardly think of employing even upon the authority of the eſtimable Conrad Gesner.

It is however poſſible, that ſuch an active ſubſtance may be uſeful in certain diſeaſes of the human body; and my very ingenious and learned friend Dr Smyth very properly tried it in ſome cutaneous diſeaſes, which are commonly very refractory. He ſucceeded in two or three caſes: but his experiments have yet been few; and in ſome of theſe he made, the operation of the medicine was ſuch as ſhows that it is to be employed with a great deal of caution.

Colocynthis.

This is one of the moſt draſtic purgatives; and I have never employed it but as it ſtood in certain compoſitions of the Diſpenſatories. Even theſe are much leſs in uſe than they formerly were. Upon the ſubject of the pilulæ ex colocynthide cum aloe, we made a remark which will alſo apply to the extractum colocynthidis compoſitum of the London College; and with reſpect to both I would now add, that as, in employing the colocynth, theſe medicines are draſtic purgatives of no other peculiar virtues, I ſuppoſe we may find for them more agreeable ſubſtitutes.

Elaterium.

This peculiar ſubſtance is variouſly prepared, and therefore, in our ſhops, is in different conditions. When properly prepared, it is a draſtic purgative, which however ſeems to have been very much employed by Sydenham and Lister in the cure of dropſy. I have not known it employed by itſelf, and only as being added in a grain or two to other purgatives, as Sydenham and Lister employed it; but what is the effect of it in compoſition it is not eaſy to determine. If Lister's obſervation of its being very heating to the body be founded, I ſhould not think of employing it at all.

CHAPTER XXI.

DIURETICA.

THESE are medicines ſuited to promote the ſecretion of urine.

THIS is to be done either by increaſing the quantity of water in the maſs of blood; or, that remaining the ſame, by introducing a matter that may be a ſtimulus to the kidneys.

As when any quantity of water is taken into the body, we find this commonly, in the courſe of twenty-four hours, returning to the ſame weight it was of before; ſo we conclude that the water thrown in has paſſed out by the excretions of perſpiration and urine, and in general we find it probable that theſe excretions will be very much in proportion to the quantity of water for the time preſent in the maſs of blood; wherefore, if the perſpiration be determined, an increaſe of the water preſent in the blood will occaſion an increaſe of the ſecretion of urine, which accordingly commonly happens: and we commonly find that an increaſe of the quantity of drink is attended with a proportional increaſe in the quantity of urine ſecreted.

This therefore is the foundation of the firſt means we have aſſigned for promoting the ſecretion of urine. The quantity of water preſent in the maſs of blood may be different from different circumſtances; but the moſt part of theſe circumſtances are hardly under the direction of our art: and the only one which is very much ſo, is the quantity of liquid taken into the body by drinking; which being therefore the chief means in our power of increaſing the quantity of water in the blood, may be conſidered as a chief means of increaſing the ſecretion of urine: and accordingly this increaſe of drink has always been conſidered as the chief of diuretics.

There are, however, certain ſtates of the body in which it may be doubtful if this means of increaſing the ſecretion of urine may be ſafely employed. It ſometimes happens that the water of the blood, inſtead of paſſing off by the excretions, is effuſed into ſome of the cavities, giving occaſion to the well-known diſeaſe of dropſy: and in ſuch a caſe it may be ſuſpected, that an increaſe of the water in the blood, made by an increaſe of drinking, may increaſe the effuſion mentioned, and aggravate the diſeaſe. This ſuſpicion has prevailed ſo much with phyſicians as to lead them in ſuch caſes to enjoin as much as poſſible an abſtinence from drinking; and it is alleged that ſuch an abſtinence has, in ſome caſes, entirely cured the diſeaſe.

WE would not rigorouſly inquire into the truth of this fact; but from all we have ſeen or heard, we are confident that it has been a very rare occurrence; and from the many inſtances we have had of its being attempted with very little benefit, we are not ſurpriſed at many phyſicians being of opinion that it ſhould not be attempted at all.

IT is an extremely painful meaſure, as it reſiſts the urgent deſire of drink which commonly attends this diſeaſe; and it may be alleged that it is not always neceſſary, as the tendency to effuſion may have its limits, ſo that the whole of the drink taken in may not run off this way, but that a portion of it may ſtill paſs by the kidneys. So far as this happens, the taking in of drink may be a ſafe meaſure; and I can aſſert, that in ſeveral caſes of conſiderable dropſy, the quantity of urine voided was nearly equal to the quantity of drink taken in, which ſhows that the drinking had been a very proper meaſure.

I WONDER, indeed, that the practitioners who have enjoined an abſtinence from drinking have not thought of a means of determining how far this was to be carried; and which certainly might be nearly determined by a compariſon of the quantity of urine voided in a given time with the quantity of drink taken in during the ſame time.

I HAVE frequently made this compariſon, and found, that a very entire abſtinence from drinking, by diminiſhing the quantity of urine voided, allowed the ſecretories of the kidneys to fall into a contracted ſtate, ſo that the quantity of urine voided was ſtill farther diminiſhed, and, as I judged, tended to increaſe the effuſion, and thereby to aggravate the diſeaſe. In other caſes I found, that when a quantity of drink was taken in, a conſiderable portion of it paſſed by the kidneys; and when, as ſometimes happened, that the quantity of urine voided was equal to the drink taken in, I concluded that the giving ſo much drink was a perfectly ſafe meaſure.

To illuſtrate this matter farther I muſt obſerve, that the water of the blood carrying the ſaline matters of it, by the nature of the animal œconomy is determined to the excretions, and particularly to the kidneys; and therefore, that drinks impregnated with ſaline matters are naturally determined this way rather than by the preternatural effuſions mentioned. The fluid poured out by theſe effuſions is nearly inſipid; whilſt, though the watery part of the blood is by theſe withdrawn from the ſecretories of the kidneys, yet a great quantity of the ſaline matter of the blood continues to paſs this way: and I therefore have been led to give for drinks, not ſimple water, but always water impregnated with ſaline matters: and I can aſſert, that water ſo impregnated paſſes more certainly to the kidneys than perfectly inſipid liquors.

THUS water impregnated with vegetable acids is not only more grateful to the patient than ſimple barley-water, or water-gruel, but paſſes always in greater quantity in proportion to the liquid taken in; and it is commonly by attending to this that I have found, even in dropſy, the quantity of urine voided to be equal to the quantity of drink taken in.

I HAVE thus endeavoured to explain ſome circumſtances in which a total abſtinence from drink may be improper, and I have pointed out ſome in which the giving drink may be a ſafe meaſure; whence the avoiding of this ſhould not have been ſo univerſal a rule as it has been with the moſt part of practitioners.

IN arguing for the exceptions that are to be made from this rule, we have alleged that the taking in of drink is proper, eſpecially when we can find the quantity of urine voided to be equal, or nearly equal, to the quantity of drink taken in; and that we eſpecially found this to be the caſe when the drink employed was impregnated with ſome ſaline matters, which determined it to go more entirely to the kidneys, and even to ſtimulate theſe to a more entire ſecretion. Reflecting upon this, I perceived that I had omitted in my Catalogue of diuretics ſome matters which are particularly well ſuited to the purpoſe of drinks, ſuch as fermented liquors of all kinds, when theſe are either weak in their quality or taken pretty well diluted with water.

EVEN ardent ſpirits, if largely diluted and joined with a portion of vegetable acid, have been found to ſtimulate the kidneys, and to make a proper part of the ordinary drink. It was alſo an omiſſion amongſt the diuretics not to mention the milk of the non-ruminant animals, and of the other milks, their products of whey and butter-milk, eſpecially when theſe are in their moſt acid ſtates.

To finiſh what relates to the giving of drink in dropſy, I muſt obſerve, that whenever we can perceive that the quantity of urine voided is equal to the quantity of drink for the ſame time taken in, I hold it to be ſafe to allow as much drink as the patient may deſire; and I have no doubt that, by ſuch indulgence, the diſeaſe may be often entirely cured. There are indeed many inſtances of the diſeaſe being cured in this manner, as in the caſes given by Sir GEORGE BAKER in the Medical Tranſactions, in thoſe quoted by Dr MILMAN from ſeveral authors, and eſpecially in the inſtances given by that ingenious author from own practice.

I CAN can give none from mine; but one accidentally fell under my obſervation. A woman labouring under an anaſarca was accidentally directed to drink a mineral water, and that in conſiderable quantity. By this her urine was greatly increaſed, and the anaſarca was ſoon entirely cured.

FROM my own practice I can obſerve, that I always thought it abſurd in phyſicians to employ diuretics while they enjoined an abſtinence from drink, which is almoſt the only means of conveying theſe diuretics to the kidneys: ſo whenever I employ diuretics, I at the ſame time adviſe drinking freely; and I am perſuaded that drinking largely has often contributed to the cures I have made.

HAVING thus mentioned the conduct of a chief means of promoting the ſecretion of urine, before I proceed to the other means that may be employed, I judge it proper to mention the chief effects of promoting this ſecretion.

As it ſeems to be the purpoſe of nature to carry out by this ſecretion the ſaline matters that, by the nature of the animal œconomy, are conſtantly generating in the maſs of blood; ſo, by increaſing the ſecretion, we carry out thoſe ſaline matters, which, from certain cauſes, abound more than ordinary in the maſs of blood.

SUCH a ſuperabundance of ſaline matter in the blood I ſuppoſe to take place in ſcurvy; and accordingly we find, that increaſing the ſecretion of urine is the chief means of curing that diſeaſe.

BUT as there are other cauſes than thoſe producing ſcurvy which may increaſe the ſaline ſtate of our fluids; ſo the increaſe of the ſecretion of urine may be a means of curing many diſeaſes, though we are not ready to point out thoſe in particular that may be ſo cured.

THE ſuppoſing an acrimony, or, what I judge to be the ſame thing, a ſaline ſtate of the fluids, has been often aſſumed at random, without evidence; and even in caſes where it was certainly exiſting, there are certain acrimonies which do not readily paſs by the kidneys, and therefore diſeaſes depending upon them which are not to be cured by increaſing the ſecretion there.

HENCE it is that the increaſe of this ſecretion may not prove a remedy in ſo many caſes as we might ſuppoſe it. On the other hand, it is to be obſerved, that as there is a balance between the perſpiration and the ſecretion of urine, ſo that the one being increaſed the other is diminiſhed; if there be a matter which nature has intended to paſs eſpecially by the perſpiration, if this is retained by increaſing the ſecretion of urine, diſeaſes may be produced: and even if the increaſed ſecretion of urine ſhould diminiſh the quantity of water which ſhould paſs by the ſkin, the ſaline matters which ſhould paſs that way by their being leſs diluted, may be more ready to ſtick in the veſſels of the ſkin, and thereby give occaſion to diſeaſes of this.

ANOTHER effect of an increaſed ſecretion of urine may be conſidered as merely the evacuation of the water, or watery parts of the blood, which, when largely increaſed, may excite an abſorption from the cavities, in which a preternatural accumulation of ſerous fluid had taken place. Thus it is that an increaſed ſecretion of urine has often proved a cure of dropſy: and for the conduct of this, by either one means or another, enough has already been ſaid above; for I doubt much if any diuretic medicines will ever be very effectual without being accompanied with an increaſe of the water in the blood by the taking in of drink.

PARTICULAR DIURETICS.

WE begin with theſe taken from the vegetable kingdom; and muſt introduce them by obſerving, that in making the Catalogue, I have been more directed by my complaiſance to the writers on the ſubject than by my own opinion and experience. The moſt part of the diuretic vegetables mentioned by writers are of very little power, and are employed with very little ſucceſs.

BUT, to ſpeak of particulars, the firſt mentioned are the *Umbellatæ*, the power of which reſides eſpecially in their ſeeds; but we have never found any of them powerful. The ſemen dauci ſilveſtris has been commended as a diuretic; but we have ſeen it employed in calculous caſes in conſiderable quantities, and for a great length of time, but never found its diuretic power anywiſe remarkable.

SOME of the plantæ ſtillatæ have been commended as diuretics; but none of them deſerve our notice except the

RUBIA TINCTORUM.

THIS root paſſes ſo much by the kidneys as to give its colour to the urine; and in paſſing that way it may be ſuppoſed to ſtimulate the ſecretories: and indeed it has been repreſented as a powerful diuretic. I have ſeen it frequently employed as a ſuppoſed emmenagogue; but its diuretic powers did not always appear, and never to any conſiderable degree. As in the many experiments made with this root on brute animals, it has always appeared hurtful to the ſyſtem, I ſhould not think it fit to be employed to any extent in men.

ALKEKENGI.

THE berries of this, the only part of it ever in uſe, are not known in the preſent practice, and I have never ſeen them employed; but I have ſome reports of their being employed by others without any effect: and if their diuretic powers had ever been remarkable, we may preſume that they would have ſtill continued in uſe. I cannot diſmiſs them without an obſervation, that as it is allowed that the berries often take a taint from the leaves of the plant, it will always require ſome caution in employing any part of a plant which is taken from an order of a very poiſonous kind.

THE *Bardana*, *Gramen*, *Lithoſpermum*, *Ononis*, *Aſparagus*, *Enula Campana*, are all ſubſtances which ſeem to paſs in ſome meaſure by the kidneys; but from frequent experience we can aſſert, that their diuretic powers are hardly ever to be taken notice of.

IN the catalogue of diuretics I have inſerted the *Aſarum*, for the ſake of this remark, that it is doubtful if any of the ſuppoſed diuretics in ſtimulating the kidneys ſhow any ſpecific power;

and,

and, on the other hand, many which do ſtimulate theſe organs ſhow the ſame power with reſpect to every other excretory to which they are applied: and hence it is that every emetic or purgative ſhow upon occaſion their diuretic powers. This ſeems to be all that is neceſſary to be ſaid of the *Aſarum*, *Geniſta*, *Nicotiana*, and *Seneka*, as inſerted in our catalogue of diuretics, as theſe are ſeldom employed in this intention alone.

THE *Arum* in its recent ſtate contains an acrid matter, which like other acrids paſſes, at leaſt in part, by the kidneys, and in proportion excites the ſecretion there; but it can never be introduced into the ſtomach in ſuch quantity as to become a powerful diuretic.

UPON the ſame ground of their containing a great deal of acrid matter, which paſſes more or leſs by the kidneys, I have inſerted in my liſt the *Perſicaria* and *Ranunculus*, which have been commonly marked as diuretics. They have, however, as ſuch been hardly employed in practice; and that for the ſame reaſon I have given with reſpect to the arum, that we have not yet learned how they can be introduced in ſuch quantity into the ſtomach as to become powerful in the kidneys.

DULCAMARA.

WE have employed only the ſtipites or ſlender twigs of this ſhrub; but as we have collected them they come out very unequal, ſome parcels of them being very mild and inert, and others of them conſiderably acrid. In the latter ſtate we have employed a decoction of them in the cure of rheumatiſm, ſometimes with advantage, but at other times without any effect. Though the dulcamara is here inſerted in the catalogue of diuretics, it has never appeared to us as powerful in this way; for in all the trials made here, it has hardly ever been obſerved to be in any meaſure diuretic.

Digitalis.

The powers of this plant as a diuretic are now aſcertained by numberleſs experiments; but upon what ſort of operation theſe powers depend, I am at a loſs to explain. Whether it be by a ſpecific ſtimulus applied to the kidneys, or by a general operation upon the ſyſtem, which particularly affects the kidneys, does not appear very clearly. The ſmall doſe in which the digitalis commonly operates, makes it difficult to ſuppoſe that ſo much of that doſe can go to the kidneys as to be a conſiderable ſtimulus to theſe organs; and, on the other hand, the effects of that doſe on the ſtomach and inteſtines, and eſpecially its effect in diminiſhing the frequency of the pulſe, are certain proofs of a general operation upon the ſyſtem.

I have introduced this ſpeculation that ſome of my readers may proſecute the enquiry; but I do not take any pains at preſent to decide in the queſtion, becauſe I do not perceive that either opinion can have any influence upon practice. This, abſtracted from all ſpeculation, muſt be eſtabliſhed by experience. With reſpect to this I could wiſh to lay down here rules for the proper management of this medicine; but I will not attempt it, becauſe I can direct my reader to a more proper means of inſtruction by referring him to the treatiſe of my very ingenious and learned friend Dr Withering on this ſubject, which is a treatiſe in many perſons hands, and, in my opinion, ſhould be in the hands of every practitioner of phyſic.

I cannot however quit this ſubject of the digitalis without obſerving, that the ſpeculation with regard to its operation, which I have ſtarted above, may occaſion the general account of the operation of diuretics which I have given above to appear leſs complete; as, beſides the increaſed quantity of water in the maſs of blood, or a ſtimulus particularly applied to the kidneys, there may be a medicine which, by a general operation on the ſyſtem, may promote the ſecretion of urine. My candour obliges me to mention this; but I do not find myſelf at preſent in a condition to proſecute the enquiry.

RUTA ET SABINA.

THESE two plants, as well as the general title of *Amara*, have been inſerted in my catalogue of diuretics inadvertently; for I do not find, either from writers or from my own experience, any authority for aſcribing a diuretic virtue to theſe plants.

SCILLA.

THIS is a root which from the moſt ancient times has been celebrated as a diuretic; and, under a proper management, it ſeldom fails to operate more or leſs as ſuch. It has not however any ſpecific power, as it ſeems to be univerſally ſtimulant with reſpect to every ſenſible part or excretory to which it is applied. It readily ſtimulates the ſtomach, and proves emetic, as we obſerved above when ſpeaking of it under that title. When it is ſo managed as to paſs the ſtomach, it ſtimulates the inteſtines, and proves purgative; and when carried into the maſs of blood, it is generally, and I believe juſtly, ſuppoſed to ſtimulate the mucous glands of the lungs, and to prove an expectorant.

WHEN it is thus ſo generally ſtimulant, we can readily underſtand why it ſhould prove a diuretic; and I would add, that probably it has ſomething in the nature of the acrimony it contains, that ſuits it to be taken up by the ſeroſity, and thereby to paſs readily by the kidneys, where its acrimony therefore increaſes the ſecretion.

THIS actually happens, and has rendered it at all times noted as a diuretic.

THIS effect, however, does not always happen; becauſe, if it be thrown into the ſtomach in ſuch quantity as to prove emetic or purgative, it is thereby prevented from reaching the blood-veſſels and kidneys; and therefore, to obtain its diuretic effects, we muſt avoid its emetic and purgative operations, which may commonly be done by giving the ſquills in ſmall doſes, to be repeated after proper intervals only: and I have found, that by accompanying the ſquills with an opiate, the emetic and purgative operation of it may be avoided, and thereby it may be carried more entirely to the kidneys.

A certain writer has alleged, that the diuretic effects of the ſquill is not to be expected unleſs it ſhows ſome operation on the ſtomach. This may perhaps be founded; but I underſtand it no other ways than that ſome operation on the ſtomach is a teſt, and a neceſſary teſt, of the ſquills being in an active ſtate; in the ſame manner as we are only certain of the activity of mercurial preparations when they have ſhown ſome effect in the mouth.

I HAVE often obſerved, that when the ſquill operates ſtrongly in the ſtomach and inteſtines, that the diuretic effects were leſs ready to happen; and therefore, as the ſquill contains an acrimony that is in part very volatile, and which is moſt ready to act on the ſtomach, that therefore the freſh ſquill, by acting more upon the ſtomach, is leſs certainly carried to the kidneys than when their volatile part is in ſome meaſure diſſipated.

It is on this account that the dried ſquill is more frequently employed than the freſh. We muſt not however miſs to obſerve here, that the drying of the ſquill is a buſineſs that requires much attention, as it may readily be overdone, and thereby render the ſquill entirely uſeleſs: And it is to be obſerved alſo, that the ſquill may not only be rendered inert by the firſt drying being too much, but that the dry powder, if kept long in a dry air, may alſo in time loſe much of its power.

This overdrying of the ſquill, in one way or other, happens more frequently than our apothecaries are aware of; and has led me to allow, that ſome operation on the ſtomach, ſome nauſea excited by the ſquill, is a neceſſary teſt of the activity of the portion of it employed.

When the ſquill is in good condition, to avoid its operation on the ſtomach and inteſtines, I have ſaid it is proper to give it in ſmall doſes, to be repeated after long intervals only; but it is proper to obſerve here, that when the diſeaſe requires a repetition, the doſes of the ſquill, as they are repeated, may be gradually increaſed, and the intervals of their exhibition made ſhorter; and when they come to be tolerably large, it is then that an opiate may be conveniently employed in directing the operation of the ſquill more certainly to the kidneys.

In the caſes of dropſy; that is, when there is an effuſion of water into the cavities, and therefore that leſs water goes to the kidneys, we are of opinion that a neutral ſalt accompanying the ſquill may be of uſe in determining this more certainly to the kidneys: and whenever it can be perceived that it takes this courſe, we are perſuaded that it will alſo be always uſeful, and generally ſafe, during the exhibition of the ſquills, to increaſe the uſual quantity of drink.

IT may be a queſtion, Whether the diuretic operation of ſquills may not be aſſiſted by ſome mercurial preparation given at the ſame time? And when there is any appearance of the medicine going to the kidneys, it cannot be doubted that the mercury, as ſtimulant of every excretory to which it is applied, may here alſo be uſeful. Accordingly it has been a frequent practice to join mercury with ſquills; but I doubt much if the common practice of employing calomel on this occaſion be proper. Calomel determines the ſquill more certainly to operate by ſtool; and unleſs the cure of the diſeaſe is to be truſted entirely to purging, the calomel may readily prevent the diuretic operation of the ſquill. We have therefore been of opinion that the leſs purgative preparations of mercury were better ſuited to the purpoſe; and we are diſpoſed to judge that the ſolution of the corroſive ſublimate, which ſo often by itſelf goes to the kidneys, may be more proper than any other.

AFTER treating of the ſquills, it ſeems proper to take notice of a title inſerted in my Catalogue that has ſome affinity with the ſquills; which is that of the

ALLIACEÆ.

ALL of theſe ſeem to contain an acrimony, which ſeems by its nature to be determined to paſs off by the kidneys; and the ſpecies *Allium ſativum* or *Garlic*, which poſſeſſes the largeſt portion of this acrimony, has been always celebrated as a diuretic.

I HAVE treated of its other virtues pretty fully above; and have only to add here, that when it is taken into the ſtomach in its freſh and recent ſtate, it almoſt always operates as a diuretic: and I am well perſuaded, that in ſeveral inſtances of my practice it has contributed to the cure of dropſy; but I have not been ſo happy as Dr SYDENHAM was, to find the diſeaſe cured by garlic alone. Practitioners have been of opinion, that the garlic is moſt effectual, when by its being taken in an entire ſtate, as explained above, it has been left to the ſtomach to extract the more volatile parts of it.

AFTER the alliaceæ I muſt take notice of ſome ſubſtances which have much affinity with theſe; and therefore, in the Catalogue, we have given the article of

SILIQUOSÆ.

THESE contain a volatile acrimony, very much akin to that of the alliaceæ, and like theſe ſeemingly diſpoſed to paſs off by the kidneys; they have therefore been always conſidered as diuretics.

THERE is however a conſiderable difference in this reſpect between the different ſpecies of this order of plants. In the leaves, ſtalks, and flowers, and ſometimes in the roots, the acrimony peculiar to the order is not very remarkable, and they ſhow little power as diuretics; but in others, eſpecially in their ſeeds, and ſometimes in their roots, the acrimony is very conſiderable; and ſo far as it can be introduced to the kidneys, it is a powerful diuretic. This ſtronger acrimony, however, is ſo ready to inflame the ſtomach, that hardly ſo large a quantity of it can be introduced as to prove a powerful diuretic, or to be depended upon in dropſies, where a large diſcharge of urine is required. The entire ſeeds may indeed, as we explained above, be introduced in large quantities, and are in ſome meaſure extracted by the ſtomach, ſo as to be in ſome meaſure diuretic; but never ſo much as to act in this way very powerfully.

THERE remain of the Catalogue of vegetable diuretics two articles to be taken notice of; which are the

BALSAMICA ET RESINOSA.

WITH reſpect to the balſamica, as I have ſaid above that all of them have for their baſis a turpentine, ſo it may be preſumed that all the balſams may have the ſame diuretic quality which we find in the moſt ſimple turpentine. This we have ſaid before to be commonly determined to the kidneys, operating there more or leſs as a diuretic; and therefore the general title of Balſamica is properly enough inſerted in our Catalogue. I muſt however obſerve with regard to them, that they cannot poſſibly be introduced into the body in ſuch quantity as to operate powerfully in any diſeaſes requiring a large diſcharge of urine.

THE diuretic ſubſtance afforded by turpentine, which has been the moſt taken notice of, is the eſſential oil obtained by a diſtillation with water. In attempting the cure of ſciatica by this oil, I have frequently obſerved its paſſing by the kidneys, and promoting the ſecretion of urine; but it can never be introduced in ſuch quantity as to be powerful in this way.

THIS obſervation applies to the oleum juniperi, which has been often employed as a diuretic; and it will readily appear, as this oil is drawn from the terebinthinate ſubſtance of the juniper, it can hardly have more power than that drawn from the turpentine itſelf.

On the ſubject of the balſamica, I have conceived an opinion which I have in ſome meaſure explained already in the article of Benzoinum, amounting to this, that the acid found in the benzoine exiſts in the oils of turpentine and of the other balſams; and that upon this particularly depends their diuretic virtues. It is therefore that ſeveral of the ſubſtances inſerted under the title of the Stimulantia Reſinoſa might have alſo been inſerted in our Catalogue of diuretics; but their power is not ſo conſiderable as to deſerve our attention here or in practice.

Having now mentioned the ſeveral vegetable diuretics, I am next to ſpeak of thoſe taken from the animal kingdom; and theſe firſt deſerving our attention are the

CANTHARIDES.

The acrimony of this inſect, and, when applied to the ſkin, its inflammatory nature, which may be readily carried ſo far as to raiſe a bliſter, is well known to all the world; and the effects of its rubefacient and bliſtering powers, in the cure of many diſeaſes, are known to every practitioner. Theſe effects, however, are not to be taken notice of here. As they may be the effects of other inſects, and of many vegetable ſubſtances, they are to be conſidered as a general remedy, none of which I propoſe to take into our treatiſe; and it is only the powers of the cantharides when taken into the body, and employed as an internal medicine, that I am to conſider.

The cantharides taken internally, whether in ſubſtance or in ſolution, if in a certain quantity, they may be conſidered as a ſtimulant and heating ſubſtance; and I have had occaſion to know them, taken in large quantity as an aphrodiſiac, to have excited violent pains in the ſtomach, and a feveriſh ſtate over the whole body.

THE cantharides however ſeems to act only in a concentrated ſtate; for taken in moderate quantity it is ſo much diffuſed in the fluids, both in the alimentary canal and in the maſs of blood, that it ſeldom ſhows any effects on the general ſyſtem. But this ſeems to be almoſt peculiar to this ſubſtance, that, given even in moderate quantity, it very readily paſſes to the kidneys; and from circumſtances which we cannot explain, it ſeems to be there united with a certain portion of the urine only; and being thus in a concentrated ſtate when carried on to the bladder, they give a conſiderable irritation and inflammation to the neck of it, in conſequence of which a frequent ſtimulus to the voiding of urine, and a painful difficulty in the voiding of it; ſymptoms very well known to every medical man under the title of Strangury, are produced.

IN explaining this very peculiar effect of cantharides, I have inſinuated a theory of their being united with a certain portion of the urine only, and of their being thereby in a more concentrated ſtate, which will not perhaps appear clear to every body; but that there is a foundation for ſuch reaſoning appears to me very ſtrongly from hence, that the effects mentioned are prevented by our rendering the urine more copious, and much diluted.

IT was proper for me to begin with an account of this frequent operation of the ſubſtance of cantharides; but it does not properly touch the medicinal powers of them, which I muſt therefore now ſpeak of.

FROM the effects mentioned, it is ſufficiently evident, that the ſubſtance of the cantharides goes to the kidneys; and it is with much probability ſuppoſed, that ſuch a ſtimulus applied there muſt promote the ſecretion of urine. THIS effect, however, does not always in fact appear; and Dr SMYTH CARMICHAEL aſſerts, that in his frequent exhibitions of the tincture of cantharides, he never once obſerved the ſecretion of urine increaſed. In many inſtances of a ſtrangury produced by the application or exhibition of cantharides, I have not found, though I have often enquired after it, the quantity of urine ſenſibly increaſed: And however it may be explained, though the ſubſtance of cantharides operates often upon the neck of the bladder, it may be doubted if at the ſame time it operates upon the kidneys; as, along with the ſtrangury ſo often occurring, I have never met with pains of the back, or other marks of an affection of the kidneys.

FROM theſe obſervations, it may be doubted if cantharides have properly any diuretic power; but the authority of the late eminent and learned WERLHOF cannot be declined. In the *Commercium Literarium Norimbergenſe*, WERLHOF gives a remarkable inſtance of the diuretic power of cantharides, and informs us, that he had frequently experienced the ſame in dropſy and other diſeaſes; and upon ſuch an authority I can no longer doubt of the power in queſtion.

IT however may be conſidered, whether the obtaining the diuretic effects of cantharides may not depend upon that adminiſtration of them which WERLHOF employed. He gave a grain of powdered cantharides for a doſe, and repeated this every four hours; and it was only after the third doſe, that a ſuppreſſion of urine, of many days ſtanding, began to yield: and I will give the reſt of what relates to this ſubject in his own words, *Operum* pag. 699. "Poſt tertium granum fluere urina parum "grumoſa ſanguinolenta, dein pituitoſa, tandem limpida coe- "pit, cum dyſuria. Continuavi, quia ſymptomata cetera ſtatim "mitigata ſunt, medicaminis uſum, ad nonam uſque doſin: quo "facto magis magiſque, et tandem largiſſime ad plures in dies "menſuras ſine febre, dolore, prodiit urina limpida, imminu- "tis ſymptomatis omnibus, ſenſimque ſola ejus remedii ὑπερεργία, "convaluit homo, jamque ſanus vivit."

BY accidental circumſtances I have myſelf been prevented from imitating this practice; and I was leſs intent upon it becauſe WICHMAN, the editor of WERLHOF's works, in a note on this ſubject, obſerves that WERLHOF himſelf did not continue the uſe of cantharides in dropſy and other diſeaſes.

ALL this, however, I thought neceſſary to lay before my readers.

CANTHARIDES have been frequently employed in the cure of cutaneous diſeaſes, and are for this particularly recommended by Dr MEAD; and as they may juſtly be ſuppoſed to paſs by perſpiration as well as by urine, the inſtances given of their utility may be very true. My learned friend Dr SMYTH CARMICHAEL, amongſt other attempts which he thought of for the cure of cutaneous diſeaſes, very properly thought of trying the cantharides. In one caſe they proved a remedy; but in ſome others, though given in large quantities, they entirely failed;

and, ſo far as I know, the experiment has not been proſecuted further.

IN another diſeaſe the cantharides have been frequently employed, and that is in a gonorrhœa and gleet. For their efficacy in ſuch caſes, we have the teſtimony of the ſame reſpectable phyſician WERLHOF. His words, in the page of his works above referred to, are the following: "Dedi in gonorrhœa in "ſubſtantia ad granum unum, duo, tria, cum oſſis ſæpiæ drach- "ma, et pro efficaciæ obſervatione, continuavi ad plures dies, "et minori id cum moleſtia fieri obſervavi, quam ſi pro more "*Bartholini*, *Liſteri*, et aliorum mihi itidem feliciter tentato, in- "fuſio in vino facto ſit."

HIS editor however tells us, that WERLHOF did not continue this practice, as he had found out a ſafer method of cure.

As I ſuppoſe the operation of cantharides, in the cure of gonorrhœa and gleet, to be by inducing ſome degree of inflammation upon the urethra, I hold the practice to be of very doubtful ſafety.

MILLEPEDÆ.

THESE inſects, like many others, contain a ſaline acrimony, which is ſuppoſed to go to the kidneys, and prove diuretic.

WHAT large quantities might do I dare not determine; but I can join my teſtimony to the account of Dr LEWIS, that I have known a large quantity, that of a hundred, given twice a-day, without any ſenſible effect upon the kidneys, and without any effect in curing the diſeaſes for which they were given.

SALES DIURETICI.

THESE, in the printing of my Catalogue, ſhould have been ſeparated from the foregoing articles by a proper ſpace, as they cannot be properly placed under the titles of either animal or vegetable diuretics.

WITH reſpect to the whole of them, it is to be obſerved, in the firſt place, that as it ſeems to be determined by the nature of the animal œconomy, that all ſaline ſubſtances received into the maſs of blood ſhould ſoon paſs out again by the excretions, and particularly by that of urine, it will be obvious that, as all ſaline matters are more or leſs ſtimulant, they muſt all of them, in paſſing by the kidneys, be more or leſs diuretic.

ACCORDINGLY their power in this way is a matter of common experience; and all of them may be employed as diuretic medicines except the volatile alkali, which cannot be introduced in the quantity neceſſary to have much effect on the kidneys.

THE acids, in their concentrated ſtate, cannot be admitted; but by being largely diluted with water, or watery liquors, they can be admitted in conſiderable quantity: and in this diluted ſtate they ſometimes prove powerful diuretics. The foſſil acids, however, can hardly be admitted in ſuch quantity as to produce any conſiderable diſcharge of urine; but the vegetable acid, in its various forms, can be taken in more largely, and prove very uſeful, particularly by rendering watery liquors more agreeable as drinks, and by conveying theſe more certainly to the kidneys, as explained above.

THE neutral ſalts, whether formed of acids and alkalines, or of acids and earths, are all of them diuretics in ſo far as they reach the kidneys; but many of them are at the ſame time laxative cathartics, and their operating by this quality commonly prevents their diuretic effects. Theſe therefore can only be obtained by the exhibition of neutrals, when they are given in ſuch ſmall doſes as cannot act upon the inteſtines, and when theſe doſes are repeated at certain intervals only; but even in this way I could hardly ever render the diuretic effects of neutrals, even thoſe of nitre, conſiderable.

THERE is however a neutral ſalt that is judged to be more certainly diuretic than any other, and has therefore been intitled Sal *Diureticus*. It is very poſſible that this ſalt may be more active in the kidneys than ſome others, and I think I have ſometimes obſerved it to be ſo; but with reſpect to it in general, I muſt declare, that, though trying the exhibition of it in various ways, I could never render its diuretic effects remarkble, or fit to be depended upon, when a large diſcharge of urine was required.

To conclude this ſubject, they are the fixed alkaline ſalts that have been eſpecially depended upon as diuretics. It has been the vegetable fixed alkali only that I have employed, and have ſometimes obtained its diuretic effects in a remarkable degree; but I have often alſo been diſappointed of theſe: and I was not ſurpriſed at this, as I believe that the alkali is almoſt always rendered neutral in the ſtomach; and in that ſtate they could have no other effect than that of other neutrals, which I have juſt now repreſented as commonly inconſiderable.

IT is however ſtill a matter of fact, that alkalines do, upon occaſion, ſhow their diuretic power; and upon the ſuppoſition juſt now made of their neutral ſtate in the ſtomach, their conſiderable operation as diuretics is not eaſily accounted for. On this ſubject, however, I ſhall offer two explanations. One is, that the quantity of alkali thrown into the ſtomach may be more than the acid there can neutralize; and therefore, that ſome portion of it may reach the kidneys in its alkaline ſtate, and prove there a more powerful ſtimulus than any neutral ſalt would be. It is upon this ground that I find a large quantity of alkali to be always neceſſary to ſhow diuretic effects.

ANOTHER explanation of the powers of alkali in producing theſe, is the following: As the acid of the ſtomach may be preſumed to be of the nature of the fermented acid of vegetables, ſo an alkali joined with it muſt form a regenerated tartar, a ſal diureticus, or kali acetatum; and if this be leſs purgative, and more diuretic than other neutrals, while it is alſo conveyed to the blood-veſſels in larger quantity, we can underſtand why, from theſe circumſtances, the fixed alkali may often appear diuretic. With reſpect to its operation as diuretic, I have another conjecture to offer. I have commonly found it prove diuretic when given with bitters, as was the manner of Sir JOHN PRINGLE; and I have imagined that, as the bitters are abſorbents of acid, they might abſorb ſo much of that preſent in the ſtomach as to prevent this from being ſo fully applied to the alkali.

I HAVE now only to add on this ſubject, that as alkalines may be often prevented, by purging, from reaching the kidneys; ſo their diuretic effect may be often more certainly ſecured by giving an opiate at the ſame time: and for the utility of this practice, ſee Dr MEAD on the ſubject of Dropſy.

AFTER the diuretic ſalts, I have ſet down in my Catalogue the Sapo Albus Hiſpanus; but after what has been ſaid above with reſpect to this medicine, I need not add any reflections here.

CHAPTER XXII.

DIAPHORETICA.

UNDER this title I comprehend all the medicines ſuited to promote a diſcharge by the ſkin, whether it be by inſenſible perſpiration or by ſweat. In the common language of writers, the term of Diaphoretica is applied to thoſe medicines only which promote the inſenſible perſpiration; and thoſe which occaſion ſweating they diſtinguiſh by the term of Sudorifera, or Sudorifica: but as, in the medicines ranged by authors under theſe titles, we can find no difference but in the degree of force, or what ariſes from the manner of adminiſtration, we comprehend the whole under the title of Diaphoretica, and ſhall employ this term only, though the effects of the medicine may be often the occaſioning of ſweat.

WE ſet out with the following propoſition.

ALL of the diaphoretics operate either by exciting the force of the circulation, or by exciting the action of the extreme veſſels on the ſurface of the body only; and theſe two operations take place ſometimes ſeparately and ſometimes together.

THE medicines which operate in theſe two ways are properly the diaphoretics we are to treat of; but there are various circumſtances of the body which may produce theſe effects, and there may be medicines which produce theſe general circumſtances of the ſyſtem, which may be, though not ſtrictly, named Diaphoretics; but they are the proper diaphoretics we are only to treat of here.

WITH reſpect to the operation of theſe, as the water of the blood paſſes out by urine or perſpiration, ſo the quantity of theſe excretions, as ſaid above, will be in proportion to the quantity of water for the time preſent in the maſs of blood; and the paſſing of it by the one excretion or the other will be determined by certain circumſtances of the œconomy, which it is proper for us here to conſider.

THE general force of the circulation, and the activity of the extreme veſſels, are what determine to, and ſupport both perſpiration and ſweat. The latter circumſtance, the activity of the extreme veſſels, may depend upon the heat of the air applied to the ſurface of the body, or upon cold applied, whilſt the circulation is by exerciſe, or other cauſes, in a vigorous ſtate.

THE determination to the kidneys ſeems to depend upon the ſaline ſtate of the ſeroſity fitted to paſs by that ſecretion, whilſt the ſituation of the kidneys is fitted for a copious ſecretion of the watery parts of the blood.

WHETHER there are any parts of the maſs of blood which, without exciting the general circulation, are particularly fitted to paſs by the ſkin, I cannot poſitively determine; but am diſpoſed to think there are none ſuch, as the function of perſpiration does not appear to be a glandular ſecretion, but merely an exhalation.

THE action of the exhalant veſſels may be excited by heat, friction, and ſtimulant ſubſtances applied externally; but it is difficult for me to conceive that any medicine, without affecting the general circulation, can be conveyed to the extreme veſſels ſo as to act on theſe only, or ſo univerſally on theſe, as in the production of ſweat muſt be ſuppoſed.

FROM the whole of what is ſaid, it would appear that there are no diaphoretics ſtrictly to be ſo called, that is, internal medicines acting upon the organs of perſpiration alone; and if, however, it appears that the action of the extreme veſſels is excited without any increaſed action of the general powers of circulation, it muſt be by medicines acting upon certain parts of the ſyſtem, which, by a conſent of nerves, can excite the action of theſe extreme veſſels. When we are therefore to ſpeak of the particular medicines enumerated under the preſent title, we are to ſpeak of all of them under the idea of their being ſudorifics, whether acting upon the general circulation or upon the extreme veſſels only, and in either caſe under a certain adminiſtration. But before entering upon this laſt circumſtance of adminiſtration, and to explain wherein it conſiſts, it is neceſſary to obſerve, that under the moſt powerful determination to the ſkin, we find that a certain application of heat to the ſurface of the body, without any aſſiſtance from powers internally applied, is ſufficient to produce ſweating; and that external cold applied can almoſt certainly prevent the ſame, though conſiderable powers are employed from within.

THE application of heat therefore to the ſurface of the body, and the avoiding of external cold, are circumſtances almoſt abſolutely neceſſary to favour the operation of ſudorifics.

THESE circumſtances may be obtained by the heat of the air applied, as in what is called the dry bagnio, or by increaſing the heat of the ſurface by previous warm bathing, or by accumulating the warm effluvia of the body itſelf upon its ſurface. This laſt may be done by covering up the body very cloſely with ſuch coverings as may both prevent the eſcape of the warm effluvia ariſing from the body itſelf, and may at the ſame time prevent the acceſs of external cold; the theory of both which contrivances is, we believe, commonly underſtood.

To favour the operation of ſudorifics, another means may be joined, which is, the taking into the ſtomach a quantity of warm liquid, which not only excites the general circulation, but particularly, by the conſent of the veſſels on the ſurface of the body with the ſtomach, excites the action of thoſe veſſels which pour out ſweat.

THESE two means of covering up the body very cloſely, and taking warm liquids into the ſtomach, are what we call the ſudorific regimen; which will often alone anſwer the purpoſe of exciting ſweat; is often neceſſary to the operation of ſudorifics; and will always render their operation more complete and permanent.

HAVING thus, as well as we can, explained the operation of diaphoretics in general, and the meaſures proper and often neceſſary in their adminiſtration, we would next conſider their general effects upon the ſyſtem.

To this purpoſe we ſay, that as their operation often depends upon their exciting the action of the heart and arteries, and thereby exciting the impetus of the blood in every part of the ſyſtem; ſo they may be uſeful in all caſes in which the circulation is languid, and when the powers of it are inert. This is ſufficiently evident in general; but the application of it to particular diſeaſes is ſomewhat uncertain, for it is difficult to determine in what circumſtances the practice may be ſafe. The languor of the circulation may be owing to the diminiſhed energy of the brain, from cauſes acting eſpecially in the brain itſelf; and in what caſes the increaſed action of the heart and arteries will remove theſe cauſes, and reſtore the energy of the brain, is very uncertain.

FOR example, in what caſes of apoplexy and palſy the action of the heart and arteries may be ſafely increaſed, it is difficult to determine: and I am perſuaded, that in very few inſtances of theſe diſeaſes the practice is admiſſible; and that, for the part, it is ready to do much harm.

WHEN the effects of the diminiſhed energy of the brain appear, eſpecially in the ſtate of the circulation, the applying of a ſtimulus to the heart and arteries may ſeem to be more ſafe and proper; but it is difficult to give the due meaſure to ſuch a ſtimulus, ſo as to render it both ſafe and durable; and we commonly find that tonics and exerciſe are both ſafer, and at the ſame time commonly more effectual. In that general loſs of tone which we call a Cachexy, tonics, rather than ſtimulants, are found to be the remedies.

WHEN there are any fixed obſtructions in any part of the ſyſtem, it is difficult to determine when the increaſed impetus of the circulation is capable of overcoming and removing them; and much random judgment has been produced on this ſubject, while it is very evident, that when ſuch increaſed impetus is not capable of overcoming the obſtruction, it is likely to prove very hurtful.

WHEN it happens that the action of the heart and arteries is already conſiderably increaſed, it will be readily ſuppoſed, that medicines which increaſe the ſame would be improper; and ſo far as they operate only by increaſing the action of the heart and arteries, they may certainly be hurtful: but as nature has intended that the effects of the increaſed impetus of the blood ſhould be obviated by the flowing of ſweat; ſo, when the operation of ſudorifics, eſpecially of thoſe acting upon the extreme veſſels alone, produces this effect, it is poſſible that this ſweating may not only render the firſt operation of ſudorifics ſafe, even in caſes where the impetus of the blood was before preternaturally increaſed, but may alſo prove a means of removing the cauſes of that preternatural increaſe, and prove a remedy of the diſeaſe.

THIS leads to the conſideration of the effects and benefit of ſweating in fevers and phlegmaſiæ. In the former, we do not doubt but that ſweating, anyhow excited, may ſometimes prove a remedy; but it is at the ſame time extremely doubtful whether it can be ſuch when it is excited by medicines acting upon the heart and arteries; and we are certain that ſuch medicines are generally hurtful. But on the other hand, when the ſweating has been brought on by medicines which act upon the extreme veſſels only, as theſe remove the ſpaſm of the extreme veſſels which ſupports the fever, they may be a cure of the diſeaſe. I am clearly of opinion, that ſweating, by ſuch a remedy, may in moſt caſes be employed; but I have not attempted it ſo often as to allow me to be very poſitive in adviſing it to be univerſally practiſed.

IN certain fevers, in which it is ſuppoſed that the contagion which had produced the diſeaſe continues to be diffuſed over the ſyſtem, and that the cure of the diſeaſe depends upon the expulſion of this matter, it has been propoſed to cure ſuch a diſeaſe by copious ſweating. Such is the caſe of the plague, which has been very univerſally treated by ſuch a remedy; and without having had ſome experience in the diſeaſe, I cannot preſume to condemn the practice; but I have many doubts to propoſe with reſpect to it, and that is enough to be ſaid here, where the diſcuſſion could not be properly introduced. We cannot however diſmiſs the ſubject without obſerving, that CHENOT, an experienced practitioner, and one of the lateſt writers, is of opinion, that the copious ſweatings formerly practiſed are by no means neceſſary; and that the judicious DE MERTENS, who writes of the plague of Moſcow 1771, does not propoſe ſweating as one of the remedies to be employed.

IN the caſe of the phlegmaſiæ, there is more difficulty in determining the propriety of ſweating; but it may in ſome meaſure be determined in the ſame manner, that is, according to the means of bringing it on. By heating, and what may be called inflammatory medicines, it is certainly improper; but by medicines acting upon the extreme veſſels alone, it may be more ſafe. As we have however found, that ſweating, even by the moſt ſimple ſudorific

dorific regimen, ſometimes aggravated inflammatory diſeaſes, we muſt ſay, that it is to be employed with doubt and caution. At the ſame time, however, the effects of DOVER's powder in rheumatiſm ſhow, that ſweating is not only compatible with, but may prove a remedy in a very inflammatory ſtate of the ſyſtem. We muſt however conclude with obſerving, that what are the circumſtances of the particular phlegmaſiæ that may determine for or againſt this practice are not ſufficiently aſcertained.

MEDICINES which promote the diſcharge by the ſkin may be ſuppoſed to be remedies in the diſeaſes of that part of the ſyſtem, and they may probably be ſuch; but the diſtinction and pathology of cutaneous affections are with me ſtill involved in ſo much obſcurity, that I am not able to ſpeak with any preciſion or clearneſs on the ſubject.

IT may be ſuppoſed, when certain acrimonies are diffuſed over the whole ſyſtem, that ſweating may be a probable means of carrying them out; and upon this footing it has been ſuppoſed, that ſweating, by certain very powerful ſudorifics, may be a means of curing the lues venerea, and it is alleged that it has actually proved ſuch. But it is not neceſſary at preſent to enter into the diſcuſſions either of the fact or the probability of it, as it is in few caſes that we ſhall think of having recourſe to the practice.

IT has been ſuppoſed that ſweating, like other ſerous evacuations, may occaſion an abſorption of ſerum from the cavities in which it has been accumulated in the various ſpecies of dropſy: and in ſome inſtances this ſeems to have happened; but it does not happen ſo readily and conſtantly as to render the practice preferable to the other practices which may be employed for the ſame purpoſe.

PARTICULAR DIAPHORETICS.

THESE are arranged in my Catalogue according as they ſeem to act eſpecially upon the heart and great arteries, or as we ſuppoſe them to act more eſpecially upon the extreme veſſels; and I have begun to enumerate theſe as we ſuppoſe them to act in the firſt manner.

THESE may all be allowed to ſtimulate the heart and arteries here enumerated: but in this they are of very different degrees of force; and many of them are ſo weak, that without great aſſiſtance from a ſudorific regimen, they are not capable to excite ſweat. Such are the *Calendula*, *Crocus*, *Dulcamara*, *Salvia*, *Scordium*, *Saſſafras*, *Sarſaparilla*; all of which, with very little choice, may be employed, but without any advantage that I can perceive.

THERE are other medicines in my liſt which are more powerful, and require leſs aſſiſtance of the ſudorific regimen; ſuch as the volatile alkali, wine, and alcohol, and the eſſential oils, or the aromatics from which theſe are obtained. The volatile alkali, in moderate quantity, may be often conveniently employed for aſſiſting the ſudorific regimen; and the ſame may be ſaid of wine and alcohol in moderate doſes: but they are in danger of going to exceſs, and in large doſes are to be conſidered in another light. The eſſential oils, or the aromatics from which they are drawn, are of the heating and inflammatory kind, and may be employed ſometimes as diaphoretic ſtimulants, but hardly in any caſe for the purpoſe of ſweating.

THE Contrayerva and Serpentaria are powerful ſtimulants, eſpecially the laſt; and both have been employed in fevers in which a debility prevailed; but with what propriety ſeems to me very doubtful. I am perſuaded that wine may always ſuperſede the ſtimulant power of theſe medicines, and that debility is better remedied by the tonic and antiſeptic powers of cold and Peruvian bark than by any ſtimulants.

ON the ſubject of the Contrayerva and Serpentaria, I cannot avoid tranſcribing the words of the judicious De MERTENS.

" RADICES contrayervæ et ſerpentariæ Virginianæ a præſtan-
" tiſſimis in arte viris tanquam optima remedia antiſeptica lau-
" datas, in febribus putridis, ſolummodo quando vires deficiunt,
" et quidem rariſſime adhibeo; experientia edoctus, illas cor-
" pori ingeſtas minus prodeſſe virtute antiſeptica, qualem ex-
" perimenta in lagenis vel ollis inſtituta ipſis ineſſe demon-
" ſtrant, quamvi calefaciente nocere. Putredinis humorum
" arcendæ et corrigendæ ſcopum ſolus abſolvit cortex Peruvi-
" anus, et ubi cardiacis opus eſt, vinum cæteris anteferendum
" mihi videtur." And in a note he has this ſtricture on two celebrated Engliſh phyſicians: " HUXHAM et PRINGLE, qui
" has radices commendant, venæ ſectionem initio harum febri-
" um ſuadent, et in ſtatu morbi vires ſtimulantibus excitare
" tentant."

OF all the diaphoretics that may be employed to excite the general circulation, I hold the guaiacum to be one of the moſt valuable, as it affords a matter which paſſes more entirely to the extreme veſſels, and ſeems to ſtimulate the exhalants more in proportion than it does the heart and great arteries. By this means it is both a more ſafe and more effectual ſudorific than thoſe which ſtimulate the latter almoſt only. It is on this account that it may be juſtly conſidered as more effectual than other ſudorifics in the cure of the lues venerea; and it is probably upon the ſame ground that it has been found ſo uſeful in all caſes of rheumatiſm, and perhaps in thoſe of gout.

HAVING thus conſidered the ſeveral diaphoretics which operate by exciting the powers of the general circulation, I muſt now ſpeak of thoſe which operate more eſpecially, or almoſt only, upon the extreme veſſels.

IN making up my Catalogue I thought of inſerting in this place *Aqua frigida.* I ſtill think I ſhould have done it, and therefore ſhall ſpeak of it here.

TAKEN into the ſtomach, it is a powerful means of exciting the action of the extreme veſſels; and with the aſſiſtance of covering the body very cloſely, it may be employed for exciting ſweat.

GALEN and his immediate followers, as well as thoſe of the 16th century, ſeem to have made much uſe of cold water, and frequently for the purpoſe of exciting ſweat: but in more modern times, ſuch practices, ſo far as I know, have been ſeldom followed; and therefore, with reſpect to the effects or propriety of them, I cannot properly give any opinion, but muſt adviſe my readers to conſult the Galenic writers, particularly LOMMIUS, upon the ſubject; and further, to conſider two paſſages in CELSUS, in Chap. VII. and IX. of his third book, which mention the exciting ſweat by a large quantity of cold water thrown into the ſtomach, and thereby curing fevers.

AFTER thus ſupplying my omiſſion of cold water, I proceed to mention the other articles of my Catalogue, which act eſpecially upon the extreme veſſels.

THE firſt are the Acid Salts, of which the foſſil ſpecies may be employed, but cannot be conveniently thrown in ſo ſuddenly as to be well adapted to ſweating; and therefore the vegetable acids have been more commonly employed. Of theſe the fermented acid or vinegar has been conſidered as the moſt effectual; and a whey made with a large proportion of vinegar proves commonly a very effectual ſudorific. It has therefore been ſuppoſed, that vinegar has a power of attenuating the fluids; but this, upon the doctrines laid down before with reſpect to attenuants, cannot be admitted: and we maintain that its ſudorific power depends entirely upon its refrigerant power in the ſtomach, analogous to what we are to ſay with regard to other ſaline diaphoretics.

SALES NEUTRI.

THESE are evidently, with a proper regimen, powerful ſudorifics, and have been frequently employed as ſuch. For the uſe of nitre in this way, ſee Dr BROCKLESBY's Obſervations, publiſhed 1764.

FOR the ſudorific powers of the ſal ammoniacus, ſee MUYS de Sale Ammoniaco; and it appears from BOERHAAVE, that the ſal digeſtivum, or febrifugum ſylvii, has been employed to the ſame purpoſe. In mentioning theſe ſudorific neutrals I need hardly add, that the ſaline mixture or neutral, formed of an alkali joined with the native acid of vegetables, is properly employed in favouring and ſupporting ſweat.

ANTIMONIUM.

WE have ſaid above that this medicine, operating, as it always does, more or leſs on the ſtomach, by that operation excites the action of the extreme veſſels. This is often to the degree of exciting ſweat; and whether for this purpoſe certain preparations of it are more fit than others, I would not poſitively determine. In the caſe of fevers, we are clearly of opinion that our nauſeating doſes have the beſt effects when they produce ſome ſweating; and that when the antimonial alone does not readily do that, it ſhould be aſſiſted by ſome neutral ſalt joined to it.

IN other caſes, as of rheumatiſm, or other inflammatory diſeaſe, the antimonial may be more certainly and properly determined to excite ſome ſweating, by being joined with more or leſs of opium.

IN my Catalogue, I think I ſhould have ſet down a general title of Emetics; as, from the analogy of antimony, we conclude, that all emetics are at the ſame time diaphoretics, and may very often be employed for exciting ſweat.

OPIUM.

THIS ſubſtance has been at all times conſidered as a powerful ſudorific; and there has hardly been any celebrated ſudorific compoſition that has not had this as a chief ingredient in it. Though I have treated above pretty largely of the medicinal qualities of this ſubſtance, it is ſtill properly conſidered here; and the queſtion that eſpecially occurs to us, is to explain upon what the ſudorific powers of opium eſpecially depend.

To this purpoſe we ſhall allow, that the ſtimulant power of opium in exciting the action of the heart and arteries, may have a chief part in its producing ſweat; but I maintain that opium does this more readily, and more ſafely, than any ſtimulants which operate in the ſame manner: and this may be accounted for, and in my opinion can only be accounted for, by ſuppoſing that opium with its ſtimulant at the ſame time exerts its ſedative powers.

THESE muſt eſpecially affect the parts moſt diſtant from the ſenſorium, which are the extreme veſſels every where. It manifeſtly diminiſhes the activity of theſe veſſels, and therefore ſuppreſſes all excretions; but even this muſt be with ſome relaxation of their tone and tenſion, whence they may more eaſily yield to the increaſed impetus of the blood in the great veſſels. In this manner we account for the ſudorific powers of this ſubſtance; and we preſume that it is conſiſtent with all the ſeveral operations and medicinal qualities of opium which we have mentioned above, and which it is not therefore neceſſary for us to repeat here.

MOSCHUS.

WHEN this is given in large doſes, it commonly induces ſleep, and almoſt as certainly occaſions a profuſe ſweat. It is therefore properly conſidered here as a ſudorific; and its operation is explained by the ſame reaſoning we have juſt now employed on the ſubject of opium. In its turn the conſideration of muſk illuſtrates and confirms that reaſoning.

IN the catalogue of diaphoretics there are two articles which I have not yet taken notice of; and I doubt if they ſhould have been inſerted. The firſt of theſe is Camphire, which, with a ſudorific regimen, might perhaps be employed: But in the frequent exhibitions of it which I have been acquainted with, I have not obſerved its tendency to excite ſweating; and therefore think it was not properly inſerted in my liſt.

THE other article I ſhould take notice of is the Hydrargyrus. This certainly reaches the extreme veſſels, and excites their action; and the moſt acrid preparation, the corroſive ſublimate, ſometimes excites ſweating: but neither this nor the other preparations are given intentionally for this purpoſe; nor in my opinion could they be conveniently employed as ſudorifics, which muſt always operate more ſuddenly than a moderate doſe of mercury could be ſuppoſed to concur with them.

CHAPTER XXIII.

MENAGOGA.

THESE are the medicines ſuited to promote the menſtrual diſcharge which occurs in the female ſex.—A ſet of medicines the moſt unfaithful; and very frequently diſappointing our expectations from them.

The writers on the materia medica, both ancient and modern, particularly the former, mention many medicines as emmenagogues; and I have employed a great number of theſe recommended by them: but I have been ſo very often diſappointed of the wiſhed-for effects, that I have ventured to allege that the ancient writers had not on this ſubject ſpoken from experience. Theſe diſappointments which I have met with, I find to have alſo happened to my fellow-practitioners; and I have not, amongſt the moſt experienced, found any one who does not acknowledge his failures in employing the emmenagogue medicines recommended by writers; nor who does not own, that he cannot almoſt in any caſe of amenorrhœa, with much confidence, promiſe ſucceſs in curing it.

WHAT is the foundation of this failure, it is not eaſy to aſſign; but I judge it to be owing to this, that we have not yet found out a medicine which has any ſpecific power in ſtimulating the veſſels of the uterus: and farther, to explain this, I muſt make a few remarks upon the nature of the menſtrual diſcharge.

I ſuppoſe then, that in conſequence of the gradual evolution of the ſyſtem, at a certain period of life, the veſſels of the uterus are dilated and filled; and that by this congeſtion theſe veſſels are ſtimulated to a ſtronger action, by which their extremities are forced open, and pour out blood. According to this idea it will appear that I ſuppoſe the menſtrual diſcharge to be upon the footing of an active hæmorrhagy; which by the laws of the œconomy is diſpoſed to return after a certain interval, and which, after ſome repetition, may, by the power of habit, be determined to return at regular periods.

THIS is my general idea, which I think may be rendered applicable to all the various phenomena and accidental occurrences which happen with reſpect to this diſcharge. It would not however be proper to enter into ſuch an explanation here; and for my preſent purpoſe I am to make uſe of one circumſtance only: This is, that as in all active hæmorrhagies the flowing of blood depends eſpecially upon the increaſed action of the veſſels of the part, ſo in the uterine diſcharge it depends upon a[illegible] increaſed action in the veſſels of the uterus.

To apply this more particularly, we muſt obſerve, that the interruption of this diſcharge is in two different ſtates; one of which is, when the menſes do not flow about the time of life that is the moſt uſual with the ſex; and the other is, when the flow has been eſtabliſhed at its uſual periods for ſome time, it is by certain cauſes interrupted from returning at its uſual times. Theſe two ſtates are well known under the titles of the *Retention* and the *Suppreſſion* of the menſtrual diſcharge. The firſt ſtate, that of retention, we ſuppoſe to depend upon ſome weakneſs of action in the veſſels of the uterus; the other, of ſuppreſſion, we ſuppoſe to depend upon ſome conſtriction in the extremities of the ſame veſſels, which prevents their yielding to the uſual impetus of the blood flowing in the larger portions of them.

THE whole of the above remarks might perhaps have been omitted here, by referring my readers to the VI. and VIII. Chapters of the Fourth Book of my *Firſt Lines*, from which they may ſtill take the doctrine more fully; but in an introduction to the Medicamenta Menagoga, I thought it neceſſary to give the general doctrine; which amounts to this, that the medicines which are to be employed in both the ſtates of amenorrhœa are chiefly thoſe which ſtrengthen and increaſe the action of the veſſels of the uterus: And with this explanation I proceed now to make ſome remarks upon

PARTICULAR EMMENAGOGUES.

ALOE.

OF this we have treated in its proper place amongſt the purgatives; and there too we have made our remarks upon its ſuppoſed emmenagogue virtues.

GUMMI FOETIDA, ET PLANTÆ FOETIDÆ.

OF theſe I have treated above under the head of antiſpaſmodics, and have there inſinuated, that they have ſeldom or never anſwered my expectations in practice as emmenagogues; but I have ſaid that there may be ſome fallacy in my experiments, and certainly I could not diſregard the general opinion ſo much as to omit them here.

CROCUS.

I MUST ſay the ſame with reſpect to this article; but I have given above my reaſons for ſuſpecting that it is a medicine for the moſt part inſignificant.

CASTOREUM.

OF this alſo I have treated above as an antiſpaſmodic, and perhaps that virtue is a good reaſon for introducing it here; but beſides that, it has as good a right to be conſidered as an emmenagogue as any of the diſagreeable odours which we have mentioned as ſuch before. The caſtor is commonly enough joined with the fetid gums; and whenever I have employed theſe with any ſucceſs, I am of opinion that the caſtor had a great ſhare in producing the effects.

WITH reſpect to the caſtor, let it be obſerved, that as it is in our ſhops it is in different conditions; that the moſt odorous is the moſt powerful medicine; and that ſome of the kinds of little odour have hardly any power at all.

FERRUM.

THIS we have alſo treated of before as an aſtringent and tonic medicine; but we have introduced it here as commonly ſuppoſed to be a very powerful emmenagogue. From the principles we have laid down above, it will readily appear that, in the caſes of retention, attended as they commonly are with a general flaccidity of the ſyſtem, the tonic powers of iron are likely to be the moſt powerful remedy; but at the ſame time, it will be probable that, in the caſes of ſuppreſſion depending upon a conſtriction of the extremities of the veſſels of the uterus, the ſame tonic powers may not be ſo properly employed.

HYDRARGYRUS.

THIS, as an univerſal ſtimulant, and as very commonly reaching the extreme veſſels, may be capable of ſtimulating thoſe of the uterus, and therefore of proving an emmenagogue. Upon this ſuppoſition it is introduced here; and, from ſeveral trials, I am perſuaded that the continued uſe of mercury has proved a cure of ſuppreſſions. How far it may be employed in caſes of retention I am uncertain; but am of opinion, that it can be neither ſo ſafely nor ſo effectually employed in theſe as in the caſes of ſuppreſſion.

END OF VOLUME SECOND.

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